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MAR 66-5

# DEPARTMENT OF DEFENSE IN-HOUSE RDT&E ACTIVITIES

810407



1 SEPTEMBER 1966

(Rev.)

## Management Analysis Report ...

Office for Laboratory Management

Office of the Director of Defense  
Research and Engineering  
Washington, D.C.

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Director of Defense Research and Engineering.

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Management Analysis Report 66-5

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Office of the Director of Defense Research and Engineering  
Department of Defense  
Washington, D.C. 20301

Approved:

  
\_\_\_\_\_  
Assistant Director (Laboratory  
Management)

## FOREWORD

At the request of the Director of Defense Research and Engineering, the Department of the Army, the Navy and the Air Force provided comprehensive financial, personnel and space data on their organizations that conduct research, development, test and evaluation (RDT&E) activities, and briefly described their individual missions, past significant accomplishments, current important efforts and planned responsibilities relating to future military problems. The statistical data relate to the past, current and budget fiscal years, i.e., 1966 through 1968.

Each in-house RDT&E organization is thus described on one page in this compilation. The data for FY 1966 are summarized on page ix. To help in locating particular organizations, an alphabetically arranged index of their names is furnished on page 139.

Budget year data represents the installation's estimate as of the end of FY 1966 and, therefore, may be at variance with the final submission of the Departmental budget because of subsequent changes.

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SUMMARY

DEPARTMENT OF DEFENSE IN-HOUSE RDT&E LABORATORIES

Program Data for FY 1966 (Actual)

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Total annual laboratory program-----	\$3,396,395,000
Total in-house program-----	2,083,109,000
Total RDT&E program-----	2,647,225,000
Total in-house RDT&E-----	1,458,498,000

---

Personnel Data--End of FY 1966

---

Personnel	Authorized strength	Total Ph.D.'s	Total professionals
Military	37,050	469	6,262
Civilian	94,591	1,936	31,022
Total	131,641	2,405	37,284

---

Physical Facilities--End of FY 1966

---

Acres	4,212,499
Space (sq ft):	
laboratory	30,747,072
administrative	9,883,497
other	64,847,048
total	105,477,617
Cost:	
real property	\$2,939,799,000
equipment	3,073,583,000
total	6,013,382,000

---

Table I. ARMY R&amp;D/E ACTIVITIES: PROGRAM AND PERSONNEL DATA, FY 1966

INSTALLATION	FUNDING* DATA (in \$ thousands)					PERSONNEL DATA					PROF. PH.D.
	TOTAL	IN-HOUSE	TOTAL R&D/E	IN-HOUSE R&D/E	MIL	CIV	MIL	CIV	MIL	CIV	
Army Research Office, Arlington, Va.	23,200	--	21,600	--	40	124	2	13	3	36	
Personnel Research Office, Wash., D.C.	2,450	2,000	2,450	2,000	12	124	--	27	1	1	
ARO, Durham, N.C.	16,000	50	15,800	50	4	83	--	13	2	21	
Surgical Research Unit, Ft. Sam Houston, Tex.	700	700	700	700	104	61	2	1	1	24	1
Aeromedical Research Unit, Ft. Rucker, Ala.	248	248	210	210	20	12	2	1	1	1	
Institute of Dental Research, Wash., D.C.	465	400	398	333	41	21	2	2	2	2	
Medical Biomechanical Research Lab., Wash., D.C.	400	400	400	400	19	36	--	1	1	1	
Medical Equipment R&D Lab., Ft. Totten, N.Y.	700	700	700	700	16	38	1	1	1	1	
Medical Research Lab., Ft. Knox, Ky.	1,507	1,500	1,500	1,200	76	134	4	13	2	25	2
Medical Res. & Nutrition Lab., Denver, Colo.	2,300	2,000	1,700	1,700	86	92	2	15	35	35	
Medical Research Unit, Europe	16	16	16	16	7	5	1	1	3	1	
Research Institute of Environmental Medicine, Natick, Mass.	5,800	5,300	5,700	4,600	45	79	11	15	14	35	
Walter Reed Institute of Res., Wash., D.C.	12,629	12,034	10,796	10,201	424	438	27	55	215	197	
Medical Research Unit, Canal Zone	136	136	136	136	16	9	--	1	1	1	
Medical Research Unit, Malaysia	136	136	89	99	9	--	--	--	4	1	
Medical Unit, Ft. Detrick, Md.	3,968	1,531	3,968	1,531	255	98	3	5	35	14	
Engineer Reactors Group, Ft. Belvoir, Va.	4,900	1,200	4,500	1,200	47	107	2	--	47	17	
Engineer Geodesy, Intelligence and Mapping R&D Agency, Ft. Belvoir, Va.	9,200	2,800	7,100	2,800	10	208	--	4	2	19	
Engineer Waterways Experiment Station, Miss.	17,500	12,800	7,300	6,300	31	1,118	1	19	23	30	
Security Agency Processing Center, Va.	351	351	45	45	22	1	--	3	1	1	
ASA Special Operations Command, Ft. Huachuca, Ariz.	1,205	1,205	214	214	192	16	--	--	13	1	
Materials Research Agency, Watertown, Mass.	12,032	8,195	7,415	7,410	5	668	4	20	4	18	
Coating & Chemical Lab., Aberdeen P.G., Md.	1,898	1,079	1,723	948	?	52	2	3	2	28	
Electronics Laboratories, Ft. Monmouth, N.J.	129,397	57,687	125,831	54,358	148	3,354	9	68	121	1,557	
Electronics R&D Activity, White Sands, N.M.	9,294	7,351	9,053	7,110	248	296	1	5	1	231	
Aberdeen Proving Ground, Maryland	57,372	26,700	29,938	11,159	502	2,634	3	1	51	463	
Infantry Board, Ft. Benning, Ga.	1,537	1,490	744	697	194	33	--	--	--	--	
Special Warfare Board, Ft. Bragg, N.C.	2,671	2,671	1,811	1,811	173	46	--	--	109	38	
Air Defense Board, Ft. Bliss, Tex.	5,172	4,641	2,882	2,351	340	106	--	--	--	34	
Arctic Test Center, Ft. Greely, Alaska	4,936	4,606	2,764	2,706	450	33	--	1	365	5	
Armor & Engineer Board, Ft. Knox, Ky.	3,205	3,105	1,538	1,519	361	94	--	--	--	52	
Artillery Board, Ft. Sill, Okla.	1,493	1,493	578	568	229	22	--	--	135	2	
Aviation Test Activity, Edwards AFB, Calif.	2,353	2,142	1,768	1,557	64	103	--	--	--	65	
Aviation Test Board, Ft. Rucker, Ala.	7,714	5,798	5,368	3,454	259	179	--	--	--	78	
Dugway Proving Ground, Dugway, Utah.	17,417	15,452	14,900	12,735	426	1,006	9	2	112	456	
Electronics Proving Ground, Ft Huachuca, Ariz.	32,357	27,034	20,294	14,989	1,466	1,459	3	2	3	218	
General Equipment Test Center, Ft. Lee, Va.	3,422	3,390	2,472	2,470	255	155	--	1	12	81	
Jefferson Proving Ground, Madison, Ind.	4,813	4,813	297	297	--	--	--	--	--	--	
Tropic Test Center, Ft. Clayton, C.Z.	1,608	1,146	1,279	820	43	46	--	4	--	25	
White Sands Missile Range, White Sands, N.M.	105,246	87,540	90,097	72,391	1,613	3,868	3	4	594	1,590	
Yuma Proving Ground, Yuma, Ariz.	13,071	8,528	8,062	6,774	300	790	2	--	6	77	
R&D Directorate, Redstone, Ala.	156,929	72,904	110,379	42,209	55	1,734	13	29	16	936	
Human Engineering Labs., Aberdeen P.G., Md.	7,333	2,142	2,116	1,529	29	160	2	10	14	34	
Nuclear Defense Laboratory, Edgewood, Md.	5,443	5,399	3,623	2,110	95	105	5	7	46	53	
Chemical Laboratories, Edgewood, Md.	48,206	35,861	42,688	26,508	331	1,967	15	63	183	973	
Biological Laboratories, Ft. Detrick, Md.	29,897	22,978	25,870	18,427	225	1,973	23	94	79	1,054	
Hatton Laboratories, Natick, Mass.	27,091	20,055	16,868	11,833	150	1,580	15	84	71	417	
Aviation Material Lab., Ft. Eustis, Va.	26,254	5,112	25,178	4,566	77	362	3	2	59	163	
Aeronautical Res. Lab., Moffett Fld, Calif.	1,684	1,084	1,669	1,669	1	37	--	--	1	15	
Cold Regions R&D Lab., Hanover, N.H.	3,636	3,434	3,300	2,517	53	219	2	15	42	145	
Engineer R&D Labs., Ft. Belvoir, Va.	34,063	17,073	23,629	19,748	27	1,090	6	10	19	571	
Research Support Group, Ft. Belvoir, Va.	3,518	3,518	1,800	1,800	--	--	--	--	--	--	
Ballistic Research Lab., Aberdeen P.G., Md.	39,368	26,368	35,488	16,356	64	1,501	8	52	59	811	
Harry Diamond Laboratories, Wash., D.C.	38,933	31,073	22,998	12,990	6	1,496	4	24	6	540	
Picatinny Arsenal, Dover, N.J.	80,168	59,618	74,750	31,259	24	3,416	8	29	9	1,283	
Frankford Arsenal, Philadelphia, Pa.	18,125	14,533	16,981	12,223	23	1,335	2	23	2	527	
Rock Island Arsenal, Rock Island, Ill.	4,975	3,710	3,714	3,219	5	458	1	2	1	129	
Springfield Armory, Springfield, Mass.	11,352	7,889	6,708	2,619	2	560	--	3	--	240	
Watervliet Arsenal, Watervliet, N.Y.	19,347	8,560	8,114	3,156	3	939	--	16	--	116	
Tank-Automotive Command Labs., Warren, Mich.	47,973	21,346	32,602	14,516	5	1,692	1	2	1	640	
Limited War Lab., Aberdeen P.G., Md.	12,028	2,427	12,577	2,427	12	133	--	2	12	58	
<b>TOTALS</b>	<b>1,123,222</b>	<b>686,503</b>	<b>883,244</b>	<b>463,937</b>	<b>9,746</b>	<b>38,481</b>	<b>213</b>	<b>776</b>	<b>2,736</b>	<b>14,828</b>	

\*For definitions see page xii.

Table II. ARMY RDT&amp;E FACILITIES DATA, FY 1966

INSTALLATION	Acres	Space and Property			Cost (in \$ thousands)	
		Laboratory	Space (square feet)	Administrative	Other	Real Property
Army Research Office, Arlington, Va.	--	--	25,320	1,640	--	--
Personnel Research Office, Wash., D.C.	--	9,710	15,357	1,922	--	1,250
ARO, Durham, N.C.	--	--	27,055	1,500	--	--
Surgical Research Unit, Ft. Sam Houston, Tex.	4	18,940	940	20,092	385	691
Aeromedical Research Unit, Ft. Rucker, Ala.	1	7,873	2,250	6,332	123	700
Institute of Dental Research, Wash., D.C.	--	2,916	3,145	3,669	143	429
Medical Biomechanical Research Lab., Wash., D.C.	2	3,909	1,734	4,318	100	200
Medical Equipment R&D Lab., Ft. Totten, N.Y.	2	5,700	11,000	16,700	500	420
Medical Research Lab., Ft. Knox, Ky.	19	84,438	38,725	--	800	1,941
Medical Res. & Nutrition Lab., Denver, Colo.	--	73,341	10,267	16,620	800	1,200
Medical Research Unit, Europe	--	3,700	1,400	1,000	40	135
Research Institute of Environmental Medicine, Natick, Mass.	--	19,201	3,910	6,451	1,290	2,300
Walter Reed Institute of Res., Wash., D.C.	--	353,200	57,500	--	7,700	7,200
Medical Research Unit, Canal Zone	--	117,400	2,600	--	250	100
Medical Research Unit, Malaysia	1	2,400	800	1,300	50	125
Medical Unit, Ft. Detrick, Md.	26	78,717	29,900	--	1,345	1,412
Engineer Reactors Group, Ft. Belvoir, Va.	--	21,000	7,000	--	3,600	2,800
Engineer Geodesy, Intelligence and Mapping R&D Agency, Ft. Belvoir, Va.	--	29,767	5,384	1,000	5,300	3,500
Engineer Waterways Experiment Station, Miss.	1,283	922,390	265,300	95,000	9,200	13,600
Security Agency Processing Center, Va.	--	1,800	1,040	--	40	350
ASA Special Operations Command, Ft. Huachuca, Ariz.	38	9,300	10,700	69,020	1,013	993
Materials Research Agency, Watertown, Mass.	--	285,000	15,000	8,000	8,000	19,000
Coating & Chemical Lab., Aberdeen P.G., Md.	--	15,054	2,720	17,172	200	300
Electronics Laboratories, Ft. Monmouth, N.J.	515	320,536	128,214	467,166	15,000	59,000
Electronics R&D Activity, White Sands, N.M.	--	45,993	42,543	5,321	4,000	25,000
Aberdeen Proving Ground, Maryland	69	--	122,000	880,020	26,000	32,000
Infantry Board, Ft. Benning, Ga.	--	--	70,285	1,750	598	613
Special Warfare Board, Ft. Bragg, N.C.	--	--	357,550	103,024	--	150
Air Defense Board, Ft. Bliss, Tex.	--	44,188	34,438	80,432	2,000	16,000
Arctic Test Center, Ft. Greely, Alaska	--	2,880	30,175	265,988	--	5,000
Armor & Engineer Board, Ft. Knox, Ky.	--	6,200	57,548	139,998	715	5,000
Artillery Board, Ft. Sill, Okla.	--	--	21,077	37,511	--	--
Aviation Test Activity, Edwards AFB, Calif.	--	25,000	18,000	100,000	--	7,110
Aviation Test Board, Ft. Rucker, Ala.	--	5,430	191,712	328,362	--	125
Dugway Proving Ground, Dugway, Utah	797,479	280,919	11,791	1,937,992	47,000	10,000
Electronics Proving Ground, Ft. Huachuca, Ariz.	51,838	14,575	305,816	1,005,552	160,000	100,000
General Equipment Test Center, Ft. Lee, Va.	--	111,633	95,688	20,998	--	2,000
Jefferson Proving Ground, Madison, Ind.	56,264	--	76,850	878,926	26,000	4,000
Tropic Test Center, Ft. Clayton, C.Z.	--	10,000	37,000	3,210,000	--	--
White Sands Missile Range, White Sands, N.M.	166,452	1,327,285	303,889	3,817,469	128,000	339,000
Yuma Proving Ground, Yuma, Ariz.	891,236	244,000	32,500	1,128,848	27,000	2,000
R&D Directorate, Redstone, Ala.	11,550	1,054,539	324,880	1,714,390	32,000	43,000
Human Engineering Labs., Aberdeen P.G., Md.	--	48,000	20,000	12,000	500	1,000
Nuclear Defense Laboratory, Edgewood, Md.	--	53,374	87,044	--	2,000	3,000
Chemical Laboratories, Edgewood, Md.	2,700	543,777	133,598	93,875	--	22,000
Biological Laboratories, Ft. Detrick, Md.	1,229	1,098,915	102,962	850,672	66,000	17,000
Haptic Laboratories, Natick, Mass.	100	423,895	65,900	58,641	30,000	9,000
Aviation Materiel Labs., Ft. Eustis, Va.	108	11,060	60,800	188,400	1,000	9,000
Aeronautical Res. Lab., Moffett Fld, Calif.	--	--	1,468	6,273	1,000	670
Cold Regions R&E Lab., Hanover, N.H.	--	34,400	38,100	17,000	3,000	5,000
Engineer R&D Labs., Ft. Belvoir, Va.	1,060	208,094	105,501	214,353	12,000	34,000
Research Support Group, Ft. Belvoir, Va.	--	--	--	--	--	--
Ballistic Research Lab., Aberdeen P.G., Md.	3,384	276,240	76,130	30,525	13,000	39,000
Harry Diamond Laboratories, Wash., D.C.	--	239,335	54,644	--	4,000	16,000
Picatinny Arsenal, Dover, N.J.	5,884	632,079	487,283	2,604,409	64,000	35,000
Frankford Arsenal, Philadelphia, Pa.	21	194,100	53,300	285,600	6,000	9,000
Rock Island Arsenal, Rock Island, Ill.	946	193,940	81,745	38,667	858	4,000
Springfield Armory, Springfield, Mass.	334	25,800	7,000	137,300	2,000	5,000
Watervliet Arsenal, Watervliet, N.Y.	3	149,900	17,913	--	1,000	1,000
Tank-Automotive Command Labs., Warren, Mich.	80	174,698	72,379	151,284	17,000	5,000
Limited War Lab., Aberdeen P.G., Md.	80	29,000	5,100	13,900	428	590
<b>TOTALS</b>	<b>1,998,750</b>	<b>9,895,443</b>	<b>4,267,671</b>	<b>21,114,566</b>	<b>752,978</b>	<b>934,394</b>

Table III. NAVY RDT&amp;E ACTIVITIES: PROGRAM AND PERSONNEL DATA, FY 1966

INSTALLATION	FUNDING* DATA (in \$ thousands)				PERSONNEL DATA					
	TOTAL	IN-HOUSE	TOTAL RDT&E	IN-HOUSE RDT&E	MIL	CIV	MIL	CIV	MIL	CIV
Naval Research Laboratory	76,227	73,595	62,617	59,985	104	3,625	1	217	2	1,076
Naval Observatory, Wash., D.C.	2,529	2,438	622	531	4	192	--	10	--	101
Underwater Weapons Research and Engineering Station, Newport, R.I.	44,497	43,296	28,404	10,867	100	1,420	--	5	5	630
Air Development Center, Johnsville, Pa.	52,481	52,481	45,326	28,500	470	1,826	1	14	35	715
Air Engineering Center, Philadelphia, Pa.	136,486	85,488	30,012	17,764	158	3,074	1	8	166	580
Ordnance Laboratory, White Oak, Md.	56,971	65,739	59,757	38,786	80	3,174	--	85	24	1,007
Weapons Laboratory, Dahlgren, Va.	28,311	28,311	19,463	11,546	121	1,894	--	15	20	520
Ordnance Test Station, China Lake, Calif.	135,500	135,500	100,750	67,500	1,093	4,852	--	76	32	1,226
Ordnance Laboratory, Corona, Calif.	21,380	21,380	16,061	9,964	5	864	--	22	4	361
Underwater Sound Lab., New London, Conn.	24,280	24,280	22,209	13,532	58	1,064	1	9	5	370
Applied Science Lab., Brooklyn, N.Y.	25,682	25,682	23,748	14,024	6	1,039	--	7	6	452
Marine Engineering Lab., Annapolis, Md.	16,925	16,925	14,748	11,400	6	310	--	15	2	365
David Taylor Model Basin, Caderock, Md.	29,902	29,902	23,490	18,083	41	1,927	1	33	12	585
Mine Defense Laboratory, Panama City, Fla.	11,610	11,513	8,862	6,610	142	640	1	9	2	258
Electronics Laboratory, San Diego, Calif.	43,220	43,220	40,211	23,021	123	1,623	1	37	32	642
Radiological Defense Lab., San Francisco, Calif.	14,905	12,312	13,630	7,996	64	575	8	58	46	272
Civil Engineering Lab., Point Loma, Calif.	6,682	6,682	6,000	4,351	5	344	--	19	3	144
Personnel Research Activity, San Diego, Calif.	1,641	1,032	1,414	1,032	32	126	--	24	7	85
Personal Program Support Activity, Wash., D.C.	2,210	2,109	1,698	1,698	16	191	--	5	--	122
Medical Research Institute, Bethesda, Md.	3,999	3,999	2,825	2,825	152	158	9	26	56	92
Aerospace Medical Institute, Pensacola, Fla.	2,611	2,611	1,239	1,239	41	92	3	4	17	17
Submarine Medical Center, New London, Conn.	4,063	1,063	916	916	29	52	1	9	7	37
Medical Field Research Lab., Camp Lejeune, N.C.	819	382	382	382	30	31	2	1	12	4
Medical Neuropsychiatric Res. Unit, San Diego	478	478	323	323	9	33	1	5	5	9
Blood Research Laboratory, Chelsea, Mass.	287	287	287	287	7	8	--	--	4	--
Medical Research Unit No. 1, Berkeley, Calif.	227	227	91	91	20	--	2	--	7	--
Medical Research Unit No. 2, Taiwan	1,113	1,113	807	807	26	9	1	2	10	5
Medical Research Unit No. 3, Cairo	933	933	543	543	34	132	2	6	13	13
Medical Research Unit No. 4, Great Lakes	695	695	496	496	33	44	--	1	8	12
Toxicology Unit, Bethesda, Md.	224	224	119	119	15	5	--	--	4	2
Air Mine Defense Development Unit, Fla.	939	939	787	787	35	--	--	--	--	--
Weapons Evaluation Facility, Albuquerque, N.M.	1,046	1,046	662	662	203	72	--	--	--	44
Aerospace Recovery Facility, El Centro, Calif.	4,849	853	1,275	787	237	52	--	--	--	13
Space Surveillance System, Dahlgren, Va.	6,552	4,984	1,000	1,000	15	115	--	--	--	98
Air Test Facility, Lakehurst, N.J.	8,634	5,978	5,590	5,282	171	482	--	7	5	5
Missile Center, Point Mugu, Calif.	21,621	10,600	14,322	8,200	1,224	1,013	3	6	110	38
Pacific Missile Range, Point Mugu, Calif.	70,475	42,533	58,249	32,265	1,275	2,765	--	4	136	475
Air Test Center, Patuxent, Md.	46,404	26,446	21,797	18,745	2,813	1,803	--	2	130	216
Air Turbine Test Station, Trenton, N.J.	7,824	5,044	5,701	4,311	12	500	--	--	8	70
Supply Research & Development Facility, Md.	1,892	1,842	1,527	1,477	8	181	--	2	3	83
Explosive Ordnance Disposal Facility, Md.	1,853	703	982	664	71	65	--	--	9	11
Ordnance Unit, Key West, Fla.	1,736	943	996	943	135	72	--	--	5	3
Ordnance Missile Test Facility, White Sands, N.M.	2,200	1,300	850	510	209	88	--	--	9	2
Weapons Materials Handling Lab., Earle, N.J.	2,322	886	1,421	529	1	46	--	--	1	23
<b>TOTALS</b>	<b>932,235</b>	<b>798,431</b>	<b>642,425</b>	<b>431,380</b>	<b>9,428</b>	<b>37,178</b>	<b>39</b>	<b>736</b>	<b>966</b>	<b>11,101</b>

## Definitions:

Total funding--Includes all sources of funds such as RDT&amp;E, Procurement Operations and Military Construction.

Total in-house funding--Funding from sources in "total funding" used to support all in-house work.

Total RDT&amp;E funding--Includes both contract and in-house work supported by the RDT&amp;E appropriation only.

In-house RDT&amp;E funding--RDT&amp;E appropriation funds used to support in-house work.

Table IV. NAVY RDT&amp;E FACILITIES DATA, FY 1966

INSTALLATION	Acres	Space and Property			Cost (in \$ thousands)	
		Laboratory	Space (square feet)	Other	Real Property	Equipment
Naval Research Laboratory, Wash., D.C.	2,768	1,785,115	116,575	705,376	51,128	26,262
Naval Observatory, Wash., D.C.	308	64,194	12,188	34,673	4,021	1,035
Underwater Weapons Research and Engineering Station, Newport, R.I.	801	267,676	118,652	662,453	14,800	5,200
Air Development Center, Johnsville, Pa.	750	761,990	51,671	454,818	21,100	20,200
Air Engineering Center, Philadelphia, Pa.	560	1,510,075	212,296	522,277	33,900	34,400
Ordnance Laboratory, White Oak, Md.	1,170	709,495	159,300	471,880	41,000	20,200
Weapons Laboratory, Dahlgren, Va.	4,500	609,332	7,447	373,869	28,800	23,800
Ordnance Test Station, China Lake, Calif.	1,125,266	853,994	289,499	6,631,165	243,300	74,200
Ordnance Laboratory, Corona, Calif.	661	328,729	56,571	115,400	7,600	11,500
Underwater Sound Lab., New London, Conn.	112	243,165	44,846	267,983	12,700	8,200
Applied Science Lab., Brooklyn, N.Y.	12	233,800	51,830	106,300	4,600	9,600
Marine Engineering Lab., Annapolis, Md.	56	224,754	34,782	163,416	11,500	6,500
David Taylor Model Basin, Caderock, Md.	186	766,122	86,771	429,538	42,400	30,900
Mine Defense Laboratory, Panama City, Fla.	651	121,892	34,096	319,758	13,700	4,800
Electronics Laboratory, San Diego, Calif.	2,838	630,541	100,338	266,972	15,000	17,900
Radiological Defense Lab., San Francisco, Calif.	619	109,500	69,100	275,500	9,800	4,600
Civil Engineering Lab., Point Loman, Calif.	23	142,021	21,977	52,263	1,836	2,193
Personnel Research Activity, San Diego, Calif.	3	21,225	2,540	21,435	162	142
Personnel Program Support Activity, Wash., D.C.	--	12,872	1,510	3,328	89	19
Medical Research Institute, Bethesda, Md.	6	57,456	16,775	79,209	3,313	1,559
Aerospace Medical Institute, Pensacola, Fla.	3	101,502	4,456	12,917	2,523	888
Submarine Medical Center, New London, Conn.	2	59,894	6,200	--	1,020	577
Medical Field Research Lab., Camp Lejeune, N.C.	1	34,626	5,097	9,978	--	236
Medical Neuro-psychiatric Res. Unit, San Diego	--	6,700	500	2,400	56	80
Blood Research Laboratory, Chelsea, Mass.	--	11,984	--	--	139	86
Medical Research Unit No. 1, Berkeley, Calif.	--	1,950	474	--	27	170
Medical Research Unit No. 2, Taiwan	2	36,430	38,674	14,195	1	456
Medical Research Unit No. 3, Cairo	3	35,000	6,000	67,900	322	415
Medical Research Unit No. 4, Great Lakes	2	16,050	6,355	25,380	365	252
Toxicology Unit, Bethesda, Md.	--	964	197	1,870	297	101
Air Mine Defense Development Unit, Fla.	6	--	1,650	21,579	199	156
Weapons Evaluation Facility, Albuquerque, N.M.	--	--	20,322	65,271	--	316
Aerospace Recovery Facility, El Centro, Calif.	--	16,270	4,766	89,060	--	--
Space Surveillance System, Dahlgren, Va.	--	--	1,800	14,200	--	5,534
Air Test Facility, Lakehurst, N.J.	2,500	53,550	30,498	78,854	31,609	5,282
Missile Center, Point Mugu, Calif.	4,253	241,016	61,847	592,222	16,894	20,233
Pacific Missile Range, Point Mugu, Calif.	27,026	34,484	206,753	2,663,034	91,600	92,100
Air Test Center, Paxcourt, Md.	7,997	870,000	151,000	3,006,852	112,800	17,400
Air Turbine Test Station, Trenton, N.J.	66	342,304	64,293	221,476	42,716	4,512
Supply Research & Development Facility, N.J.	6	'44	24	100	--	1,000
Explosive Ordnance Disposal Facility, Md.	1	33,208	--	89,116	2,005	342
Ordnance Unit, Key West, Fla.	5	74,819	16,079	18,223	1,602	486
Ordnance Missile Test Facility, White Sands, N.M.	112	71,199	31,719	235,131	5,173	2,497
Weapons Materials Handling Lab, Earle, N.J.	2	14,542	858	28,050	297	183
TOTALS	1,183,287	11,510,506	2,152,328	19,161,422	870,594	456,512

Table V. AIR FORCE RDT&amp;E ACTIVITIES: PROGRAM AND PERSONNEL DATA, FY 1966

INSTALLATION	FUNDING* DATA (in \$ thousands)				PERSONNEL DATA					
	TOTAL	IN-HOUSE	TOTAL RDT&E	IN-HOUSE RDT&E	MIL	CIV	MIL	CIV	PH.D.	PROF.
Materials Laboratory, WPAFB, Ohio	58,505	5,962	34,817	5,962	59	361	6	14	64	233
Aeromedical Research Lab., Alaska	992	495	79	495	22	24	1	7	12	9
Epidemiological Lab., Lackland AFB, Tex.	526	256	256	256	42	13	4	1	12	4
651st Aeromedical Lab., Holloman AFB, N.M.	1,836	757	1,656	577	63	27	10	3	19	5
School of Aviation Medicine, Brooks AFB, Tex.	14,238	6,674	9,847	6,572	566	451	91	58	143	154
650th Aerospace Medical Res. Lab., WPAFB, Ohio	12,772	3,385	10,752	3,385	140	229	16	25	55	111
Rome Air Development Center, Griffiss AFB, N.Y.	155,583	15,521	81,504	15,113	328	1,293	3	12	115	526
Avionics Lab., WPAFB, Ohio	72,743	3,585	67,644	3,585	82	452	2	8	60	290
6570th Personnel Res. Lab., Lackland AFB, Tex.	2,193	1,316	1,751	1,216	85	130	1	25	14	39
Weapons Lab., Kirtland AFB, N.M.	28,966	6,965	26,355	6,704	557	280	22	14	320	81
Rocket Propulsion Lab., Edwards AFB, Calif.	57,907	10,634	49,706	10,034	333	459	3	7	109	125
Flight Dynamics Lab., WPAFB, Ohio	31,800	3,900	30,300	3,900	97	654	2	12	57	358
Aeropropulsion Lab., WPAFB, Ohio	94,410	1,819	94,392	1,319	61	329	1	5	57	174
Armament Lab., Eglin AFB, Fla.	77,592	2,500	58,238	2,500	161	238	2	4	117	130
Flight Test Center, Edwards AFB, Calif.	40,326	37,235	32,635	30,288	3,286	2,152	2	2	238	143
Special Weapons Center, Kirtland AFB, N.M.	47,928	21,141	36,935	20,751	1,728	1,211	1	59	52	
Air Proving Ground Center, Eglin AFB, Fla.	63,225	50,181	55,764	46,320	4,932	2,582	2	2	293	264
Missile Development Center, Holloman AFB, N.M.	45,604	23,906	34,571	22,581	2,204	1,691	2	6	175	188
Arnold Engineering Development Center, Tenn.	66,354	59,860	65,311	59,859	115	147	3	1	46	40
Eastern Test Range, Patrick AFB, Fla.	226,557	226,557	211,058	211,058	2,030	2,430	4	2	207	131
Western Test Range, Vandenberg AFB, Calif.	65,124	53,166	51,022	51,022	295	475	--	--	51	171
Systems Engineering Group, WPAFB, Ohio	38,361	29,390	36,127	29,390	242	2,004	3	3	147	1,164
Cambridge Res. Labs., L. G. Hanscom Fld, Mass.	67,192	23,013	62,250	21,397	195	904	/	133	79	521
Office of Scientific Research, Arlington, Va.	54,057	1,863	53,664	1,470	32	106	3	22	24	30
Aerospace Research Laboratories, WPAFB, Ohio	14,643	6,956	13,871	6,184	83	243	18	55	58	127
Frank J. Seiler Research Lab., Academy, Colo.	461	461	232	232	19	18	11	1	18	5
Office of Research Analyses, Holloman AFB, N.M.	1,043	677	701	511	13	29	--	8	11	17
<b>TOTALS</b>	<b>1,340,938</b>	<b>598,175</b>	<b>1,121,556</b>	<b>563,181</b>	<b>17,876</b>	<b>18,932</b>	<b>217</b>	<b>424</b>	<b>2,560</b>	<b>5,093</b>

Table VI. AIR FORCE RDT&amp;E FACILITIES DATA, FY 1966

INSTALLATION	Acres	Space and Property			Cost (in \$ thousands)		
		Laboratory	Space (square feet)	Administrative	Other	Real Property	Equipment
Materials Laboratory, WPAFB, Ohio	9	165,274	67,297	36,025	5,982	8,839	
Aeromedical Research Lab., Alaska	10	19,124	2,218	13,865	1,595	506	
Epidemiological Lab., Lackland AFB, Tex.	3	18,964	791	3,048	660	438	
651st Aeromedical Lab., Holloman AFB, N.M.	45	61,223	7,200	1,306,789	2,337	3,245	
School of Aviation Medicine, Brooks AFB, Tex.	41	153,052	57,292	431,152	15,578	14,576	
6570th Aerospace Medical Res. Lab., WPAFB, Ohio	16	226,494	21,160	--	8,919	14,484	
Rome Air Development Center, Griffiss AFB, N.Y.	1,946	546,078	92,402	130,000	19,271	76,314	
Avionics Lab., WPAFB, Ohio	278	202,757	5,304	173,377	9,758	20,162	
6570th Personnel Res. Lab., Lackland AFB, Tex.	7	45,054	2,600	2,235	520	1,655	
Weapons Lab., Kirtland AFB, N.M.	186	238,100	15,900	37,500	4,804	16,351	
Rocket Propulsion Lab., Edwards AFB, Calif.	53,120	482,113	41,812	145,526	69,060	35,000	
Flight Dynamics Lab., WPAFB, Ohio	90	545,732	56,614	24,949	22,015	51,648	
Aeropropulsion Lab., WPAFB, Ohio	43	412,600	70,100	220,700	13,162	29,380	
Armament Lab., Eglin AFB, Fla.	20	50,995	12,749	7,160	1,992	2,694	
Flight Test Center, Edwards AFB, Calif.	300,722	739,851	486,752	2,491,246	73,045	46,500	
Special Weapons Center, Kirtland AFB, N.M.	2,321	195,282	752,700	2,613,919	23,319	24,419	
Air Proving Ground Center, Eglin AFB, Fla.	464,564	103,624	538,694	6,821,682	158,600	154,948	
Missile Development Center, Holloman AFB, N.M.	97,436	555,993	173,218	3,031,885	95,465	62,190	
Arnold Engineering Development Center, Tenn.	40,121	1,078,761	198,831	520,284	393,101	36,279	
Eastern Test Range, Patrick AFB, Fla.	28,921	2,670,144	781,168	5,640,236	334,700	941,000	
Western Test Range, Vandenberg AFB, Calif.	39,111	19,017	192,408	818,056	37,120	96,157	
Systems Engineering Group, WPAFB, Ohio	100	119,054	326,228	--	2,676	9,635	
Cambridge Res. Labs., L.G. Hanscom Fld, Mass.	874	536,528	23,903	92,808	16,575	26,903	
Office of Scientific Research, Arlington, Va.			25,593	3,961	--	159	
Aerospace Research Laboratories, WPAFB, Ohio	50	141,906	7,370	--	4,762	8,124	
Frank J. Seiler Research Lab., Academy, Colo.	--	7,885	1,335	--	--	989	
Office of Research Analyses, Holloman AFB, N.M.	--	4,548	1,359	4,687	193	82	
<b>TOTALS</b>	<b>1,030,454</b>	<b>9,341,123</b>	<b>3,463,498</b>	<b>24,571,060</b>	<b>1,316,227</b>	<b>1,682,677</b>	

\*For definitions see page xi.

DEPARTMENT OF THE ARMY

NAME AND LOCATION: U.S. Army Research Office  
Arlington, Virginia  
COMMAND: Office of the Chief of Research and Development  
Commanding Officer: Colonel Thomas N. Chavis  
Deputy Chief of Army Research and Scientific Director: Dr. Richard A. Weiss

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0	0	0
Total in-house RDT&E *	0	0	0
Annual operating cost *	1.6	1.6	1.9
Total RDT&E program	21.6	19.9	23.9
Total procurement program			
Total O&M program	1.6	1	1
Total other programs			
Total annual lab. program	23.2	20.9	24.9

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	40	2	36	4
Civilian	124	18	64	60
Total	164	20	100	64

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	25,320	1,640	26,960	0	0

MISSION: Exercises general staff supervision of the research program of the Army (except atomic energy and a portion of chemical and biological warfare); exploratory development; development and test of meteorological materiel and electron devices; the Army Medical Services RDT&E Program; the Army Operations Research Program; the Army Human Factors Research Program; and the Army Scientific and Technical Information Program. Directs the activities of the Army Personnel Research Office and the Army Research Offices in Durham, Europe, the Far East and Latin America.

PAST SIGNIFICANT ACCOMPLISHMENTS: Not applicable. The Army Research Office performs no in-house R&D. In carrying out its missions, it awards and monitors R&D contracts and grants on behalf of the parent command and other Army staff agencies and non-Army activities.

CURRENT SIGNIFICANT EFFORTS: (See preceding comments.)

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (See preceding comments.)

NAME AND LOCATION: U.S.Army Personnel Research Office  
 Tempo A Bldg., 2d and V Sts, S.W., Washington, D.C. 20315  
 COMMAND: Office of the Chief of Research and Development  
 Commanding Officer: Colonel Marshall O. Becker, GS  
 Director of Research Laboratories and Technical Director: J.E. Uhlaner, Ph.D.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.0	1.95	2.03
Total in-house RDT&E*	2.0	1.95	2.03
Annual operating cost*	0.15	0.16	0.17
Total RDT&E program	2.45	2.48	2.66
Total procurement program			
Total O&M program			
Total other programs			
Total annual lab. program	2.45	2.48	2.66

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	12	0	0	12
Civilian	124	27	61	44
Total	136	27	61	56

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
NA	9,710	15,357	1,922	26,989	NA

MISSION: To optimize contribution of man's performance in varying contexts of jobs: In selection research, jobs in the aggregate (general common factors in large job classes); in human-performance experimentation, task slices common to various jobs; and in manned-systems research, jobs arising from the man-machine interface involving man and sophisticated equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Unique Information Systems Laboratory tied to computer for real-time information processing. (2) Probability equations for determining that given image-interpretation identification is correct. (3) No difference between alphanumeric or graphic depiction of information among command information-processing personnel making final decisions. (4) Study on qualification requirements for enlisted input indicates current standards too low. (5) Manpower-systems models developed to evaluate rotation policies and alternate force structures.

CURRENT IMPORTANT EFFORTS: (1) Feasibility and usefulness of cost estimates to control information produced by TIIIF (tactical image-interpretation facility). (2) Improve effectiveness of Army Security Agency operations (monitoring) by vigilance research. (3) Assess manpower requirements. (4) New combat-classification instruments. (5) Differential motivation measures for broad occupational areas. (6) Objective performance measures for evaluating man-machine interface in information systems. (7) Impact of mental-ability categories on Army performance.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Integrate, evaluate and improve total system configuration of men, equipment and procedures in surveillance information processing. (2) Improve extraction of information from communications media. (3) Study interfaces of man-machine components within ADSAF (automatic data system for the Army in the field) systems. (4) Solve personnel-management problems in distribution, training and career progression. (5) Common servicewide aptitude test battery and related instruments. (6) Measures to identify future junior officers with high career motivation.

NAME AND LOCATION: U.S. Army Research Office - Durham  
 Durham, North Carolina  
 COMMAND: Office of the Chief of Research and Development  
 Commanding Officer: Colonel John C. Raaen, Jr.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.05	0.05	0.06
Total in-house RDT&E *	0.05	0.05	0.06
Annual operating cost*	1.1	1.1	1.1
Total RDT&E program	15.8	16.1	17.4
Total procurement program	0	0	0
Total O&M program	0.2	0.2	0.2
Total other programs	0	0	0
Total annual lab. program	16.0	16.3	17.6

Note: \*Included in the totals.

PERSONNEL DATA-END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	4	0	3	1
Civilian	83	18	31	52
Total	87	18	34	53

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other*	Total building	Real property	Equipment
0	0	27,055	/16,000/	27,055	0	0

\* Parking lot

MISSION: To conduct the portion of the Army's basic research program in mathematics and the physical, engineering and environmental sciences that is accomplished through contracts and grants with educational institutions, research institutes and industrial laboratories in the United States. (See AR 70-40, paragraph 2.)

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Inauguration of the Military Theme Program. (2) Initiation and implementation of Scientific Services. (3) Support of basic research responsible for superconductivity photo echo, vacuum missile launch, high-strength silicon carbide.

CURRENT IMPORTANT EFFORTS: (1) Development of high-temperature ceramics. (2) High-pressure synthesis of improved polymers. (3) New approaches to solution of nonlinear systems. (4) Development of new lasing systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Research directed toward ductile ceramics. (2) Support of studies leading to improved semiconductors. (3) New approaches to better communication methods. (4) Information leading to new and novel sensors and detectors. (5) Data providing a base for night-vision devices.

NAME AND LOCATION: U.S. Army Surgical Research Unit (tenant)  
 Brooke Army Medical Center, Fort Sam Houston, Texas  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Colonel John A. Moncrief, MC  
 Technical Director: Dr. Arthur Mason

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.700	0.720	0.750
Total in-house RDT&E*	0.700	0.720	0.750
Annual operating cost *	0.030	0.050	0.055
Total RDT&E program	0.700	0.720	0.750
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	0.700	0.720	0.750

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	104	2	24	80
Civilian	61	1	14	47
Total	165	3	38	127

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
4	18,940	940	720,092	39,976	0.385
					0.691

MISSION: To conduct studies in treatment of thermal and traumatic injuries; to provide care for patients with those types of injuries; and to train others in the care of those patients.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Use of salt water as sole replacement for acute blood loss. (2) Delineation of burn-wound sepsis (BWS) as primary cause of death in burns and pathogenesis of BWS. (3) Control of BWS by effective topical therapy, with resultant 50-percent decrease in mortality. (4) Treatment of acute renal failure by citronic hemodialysis. (5) Therapy of thrombophlebitis and arterial anastomoses with Dextran.

CURRENT IMPORTANT EFFORTS: Delineation of (1) pulmonary problems subsequent to thermal injury; (2) biomechanics of circulatory changes in postburn period; (3) etiology of Curling's ulcer; (4) effect of thermal munitions on combat effectiveness; (5) development of effective Pseudomonas antiserum.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) The continuation of items listed under current important efforts, which will take considerable time and effort. (2) Studies in the more complex metabolic responses to thermal injury as a model for response to all types of trauma. (3) Expansion of studies in acute mechanical trauma.

NAME AND LOCATION: U.S. Army Aeromedical Research Unit (tenant)  
Fort Rucker, Alabama

COMMAND: U.S. Army Medical R&D Command

Commanding Officer: Lt. Colonel Robert W. Bailey, MSC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.260	0.315	0.345
Total in-house RDT&E *	0.210	0.250	0.275
Annual operating cost *	0.040	0.055	0.060
Total RDT&E program	0.209	0.260	0.275
Total procurement program	0	0	0
Total O&M program	0.039	0.055	0.060
Total other programs	0	0	0
Total annual lab. program	0.248	0.315	0.345

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	20	4	11	4
Civilian	12	0	3	8
Total	32	4	14	12

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
1	7,873	2,250	16,332	16,455	0.123
					0.7

MISSION: Researches problems of a fundamental or immediate nature relevant to Army aviation and airborne physical performance standards, medical aspects of retention and selection, training, operations, and equipment requirements. Collaborative studies are performed whenever possible to avoid unnecessary duplication.

PAST SIGNIFICANT ACCOMPLISHMENTS: Surveys of noise problems in aircraft operations and internal and external sound pressure levels in Army aircraft. Air-drop of ACD whole blood. Color-vision deficiencies in Army fliers. Noise spectra of Bell OH-13T helicopter and Turbo-Beaver. Study of impulse noise due to aircraft armament. Special phonocardiography technique. Study of relationship of height-weight ratio to performance in airborne training.

CURRENT IMPORTANT EFFORTS: Significant studies are being conducted in vision, toxicology, cardiology, biophysics, aviation psychology, physiology and neurology.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue to investigate problems of a fundamental and immediate nature that relate to medical aspects of Army aviation and airborne operations.

NAME AND LOCATION: U.S. Army Institute of Dental Research (tenant)  
 Walter Reed Army Medical Center, Washington, D.C.  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Colonel George W. Burnett, DC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	0.400	0.440	0.567
Total in-house RDT&E *	0.333	0.373	0.500
Annual operating cost *	0.096	0.098	0.100
Total RDT&E program	0.398	0.443	0.570
Total procurement program	0	0	0
Total U&M program	0.067	0.067	0.067
Total other programs	0	0	0
Total annual Tab. program	0.465	0.510	0.637

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	41	2	22	19
Civilian	21	1	9	12
Total	62	3	31	31

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	2,918	3,145	3,669	9,732	0.143

MISSION: To conduct research in the etiology, prevention and control of oral diseases and in the development of rapid and effective dental treatment, particularly maxillofacial injuries. To investigate and develop new dental materials, and to conduct education and training programs.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Cyanoacrylates in wound treatment. (2) Cause and prevention of dental calculus, oral disease in Southeast Asia. (3) Simple and effective treatment of periodontal disease. (4) Effect of stress on oral tissues. (5) Development of preventive dental practices. (6) Development of new dental materials for field use.

CURRENT IMPORTANT EFFORTS: (1) Maxillofacial wounds--bacteriology, radiation, stress and hormones, gaseous environment, radiation, trace elements, chemical adhesives. (2) Periodontal disease. (3) Trace elements, nutritional deficiencies, immunization, antibiotics, stress, calculus formation. (4) Preventive dentistry. (5) Development of combat restorative materials.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will be directed to: (1) new approaches to rapid dental treatment of the soldier in regard to maxillofacial wounds; (2) prevention and control of oral disease; (3) clinical dental practice procedures; (4) effect of stress on oral tissues, structures and organs; (5) dental materials.

NAME AND LOCATION: U.S. Army Medical Biomechanical Research Laboratory (tenant)  
Walter Reed Army Medical Center, Washington, D.C. 20012

COMMAND: U.S. Army Medical R&D Command

Commanding Officer: Colonel Peter M. Margetis, DC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.4	0.5	0.6
Total in-house RDT&E *	0.4	0.5	0.6
Annual operating cost *	0.1	0.1	0.1
Total RDT&E program	0.4	0.5	0.6
Total procurement program			
Total O&M program			
Total other programs			
Total annual lab. program	0.4	0.5	0.6

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	19		8	5
Civilian	36	2	14	18
Total	55	2	22	23

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
2	3,909	1,734	4,318	9,963	0.1	0.2

MISSION: To conduct fundamental and applied research to develop materials and devices for internal and external medical biomechanical application.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) APRL (Army Prosthetics Research Laboratory) amputee hook. (2) Technique and components for cineplasty of amputees. (3) Biostable polymers for use as surgical implants. (5) APRL mechanical hand and cosmetic glove. (5) Porous, laminated sockets.

CURRENT IMPORTANT EFFORTS: (1) Physiological tissue adhesives and hemostatic agents. (2) Electromechanical hand with automatic proportional control. (3) Resilient, soft mechanical hand. (4) Biodegradable polymers for use as surgical implants. (5) Polyallomer optical inserts for protective masks.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Work will continue on the synthesis and evaluation of tissue adhesives for the rapid nonsuture closure of wounds and as hemostatic agents. Also, efforts will be expanded to develop internal, external and maxillofacial prostheses.

NAME AND LOCATION: U.S. Army Medical Research and Nutrition Laboratory (tenant)  
Fitzsimons General Hospital, Denver, Colorado 80240

COMMAND: U.S. Army Medical R&D Command  
Commanding Officer: Colonel James Syner, MC  
Technical Director: Dr. Howerde Sauberlich

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.0	1.9	2.1
Total in-house RDT&E *	1.7	1.8	2.1
Annual operating cost *	0.3	0.3	0.3
Total RDT&E program	1.7	1.8	1.8
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.6	0.7	0.7
Total annual lab. program	2.3	2.5	2.5

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	86	9	38	48
Civilian	92	10	36	56
Total	178	19	74	104

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
73,341	10,267	716,620	7	100,228	0.8	1.8

MISSION: To investigate the adequacy of the soldier's diet, determine nutrient intake, assess health as related to the nutritional status of troops in all environments, and make recommendations. To conduct research on medical and surgical problems of special interest to the Army. To study the physiology of exercise and fatigue. To conduct research on the application of computer techniques to medical research and medicine.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) System designed for digital computer integrating variables in medical practice of pulmonary disease. (2) Ration testing and survey. (3) Influence of altitude on human and animal performance. (4) Collaborative tuberculosis-treatment program with Fitzsimons General Hospital. (5) Collaboration with Office of International Research to assess nutritional status of world's civil and military populations.

CURRENT IMPORTANT EFFORTS: (1) Continuation of above. (2) Studies of amino-acid requirements, imbalances and toxicity, lipid metabolism and vitamin nutrition. (3) Minimal caloric and nutrient requirements to maintain soldiers under combat conditions. (4) Cardiovascular and metabolic nature of fatigue. (5) Enlargement of computer techniques for evaluation, differential diagnosis and prognosis of patients suffering from pulmonary disease.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Nutrition studies for evaluation of minimal caloric intake during combat patrols in various environments. (2) Performance evaluation and role of physiological mechanisms at high altitude. (3) Study of metabolic pathways in health and disease under controlled conditions. (4) Development of computerized data banks in nutrition and high altitude.

NAME AND LOCATION: U.S. Army Medical Research Unit, Europe (tenant)  
(Landstuhl, Germany) APO New York 09180

COMMAND: U.S. Army Medical R&D Command  
Commanding Officer: Major Frank C. Leitnaker, Jr., MC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.016	0.016	0.016
Total in-house RDT&E *	0.016	0.016	0.016
Annual operating cost*	0.003	0.003	0.003
Total RDT&E program	0.016	0.016	0.016
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	0.016	0.016	0.016

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	7	1	3	3
Civilian	5	1	1	4
Total	12	2	4	7

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
3,700	1,400	1,000	6,100	0.040	0.135

MISSION: Includes, but is not limited to, establishing base lines for body burdens of internal emitters for isotope handlers; surveillance of milk for fresh fission products; assisting surgeons, U.S. Army, Europe (USAREUR), with problems related to nuclear medicine; providing requested teaching service and consultation for USAREUR units and European Research Office; advising Army Medical R&D Command of medical research in USAREUR by non-R&D personnel.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Quantitate body burdens of cesium-137 (2) Technic for detecting metastatic carcinoma of the thyroid. (3) Surveillance of precipitation, soil and foodstuffs for nuclear fission products. (4) Consultation and teaching service for USAREUR units. (5) Study effect of adenine on the viability of stored whole blood.

CURRENT IMPORTANT EFFORTS: (1) Correlate whole-body potassium with physical fitness. (2) Surveillance of individuals associated with radionuclides for urinary alpha activity and for whole-body isotope burden. (3) Learn of radio-protective drugs and research originating from European laboratories. (4) Preservative effect of adenine on stored blood. (5) Surveillance of milk for fission products.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Complete or continue (1) study of the preservative effect of adenine on stored blood; (2) study correlating whole-body potassium with physical condition; (3) obtaining information on the European radioprotective drug program; (4) monitoring cesium-137 body burdens of Germans; (5) surveillance of milk for fresh fission products.

NAME AND LOCATION: U.S. Army Medical Equipment Research and Development Laboratory (tenant), Fort Totten, Flushing, L.I., New York 11359

COMMAND: U.S. Army Medical R&D Command

Commanding Officer: Colonel Lee A. Grove, MSC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.7	0.9	1.4
Total in-house RDT&E *	0.7	0.9	1.4
Annual operating cost*	0.1	0.16	0.2
Total RDT&E program	0.7	0.9	1.4
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	0.7	0.9	1.4

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	16	1	1	12
Civilian	38	0	10	29
Total	54	1	11	41

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
2	5,700	11,000	16,700	33,400	0.5	0.42

MISSION: To conduct engineering R&D leading to new items of military medical equipment for the Army and, as required, the Navy and the Air Force. This includes medical, surgical, veterinary, dental and opticians' instruments, equipment and supplies; hospital furniture, equipment, utensils and supplies; medical sets, kits and outfits; medical, dental and veterinary x-ray equipment and supplies; insect- and rodent-control equipment; combat-casualty evacuation system.

PAST SIGNIFICANT ACCOMPLISHMENTS: Type-classified FY 1965-66: anesthesia apparatus; intradermal injection accessory; field sterilizer; field autoclave; portable medical laboratory, portable explosion-proof field surgical suction pressure apparatus, field surgical basin stand; foot-power jet injection apparatus. Also, electrocardiograph, folding litter, respirator (iron lung), vision-test charts, audiometer.

CURRENT IMPORTANT EFFORTS: (1) Arthropod- and rodent-control equipment--sprayers, dispenser, trap, delousing. (2) Portable field medical and surgical equipment and supplies--resuscitator, x-ray, dental. (3) Folding bed and cot, inflatable litter; water distiller; plastic and disposable containers. (4) Scrub sink, operating table, plastic surgical instruments; blood and biologicals refrigerator; autopsy kit; portable medical laboratory. (5) Automatic spectacle-lens fabrication, etc.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: This organization has been alerted to expect the assignment of approximately 80 new development tasks, to be completed by the end of the second quarter of FY 1969.

NAME AND LOCATION: U.S. Army Medical Research Laboratory (tenant)  
Fort Knox, Kentucky 40121

COMMAND: U.S. Army Medical R&D Command  
Commanding Officer: Colonel Robert J. Hoagland, MC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.5	1.8	1.8
Total in-house R&D*	1.2	1.4	1.5
Annual operating cost*	0.3	0.4	0.3
Total R&D program	1.5	1.8	1.8
Total procurement program	0	0	0
Total O&M program	0.007	0.6	0.6
Total other programs	0	0	0
Total annual lab. program	1.507	2.4	2.4

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	76	4	28	66
Civilian	134	15	49	66
Total	210	19	77	132

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
19	84,438	38,726	None	123,164	0.8
					1.941

MISSION: Basic and applied research on military medical problems of biochemical, biophysical and psychophysiological nature. Support of human-factors activities Army-wide. Blood-transfusion research and blood-bank fellowship training.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Psychophysiological studies to learn man's capabilities and limitations and the man-environment interface relating to military activities. (2) Promising early data from studies of biological effect of laser radiation on molecular and subcellular systems. (3) Successful in vivo studies of blood preserved in ACD and in ACD with adenine. (4) Novel method of detoxifying snake venoms and producing antibodies by toxoid.

CURRENT IMPORTANT EFFORTS: Psychophysiological and biological studies of laser effect on living membranes; approaches to studying flashblindness from laser radiation. (2) Night-vision studies. (3) Studies of blood preserved by ACD and by ACD with adenine, reaching applied stage. (4) Preparation of multivalent antisera against snake venoms. (5) Improvement of blood grouping and identification of universal donors among group-O individuals.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Studies of night-vision capability and equipment. (2) Acquisition of new high-energy continuous-wave carbon-dioxide-gas laser greatly extends knowledge of laser hazards. (3) Expanded studies in blood banking, grouping, transfusion and preservation will have worldwide military and civilian significance.

NAME AND LOCATION: U.S. Army Research Institute of Environmental Medicine  
Natick, Massachusetts (tenant)

COMMAND: U.S. Army Medical R&D Command

Commanding Officer: Lt. Colonel James E. Hansen, MC

Technical Director: Dr. David E. Bass

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5.8	2.4	3.1
Total in-house RDT&E *	4.6	1.5	2.1
Annual operating cost*	1.1	0.7	0.7
Total RDT&E program	5.7	2.2	2.8
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.1	0.2	0.3
Total annual lab. program	5.8	2.4	3.1

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	45	11	14	17
Civilian	79	16	35	46
Total	124	27	49	63

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
19,201	3,910	6,451	29,562	1.29	2.3

MISSION: To understand complex effects of climatic stresses on human body and its defenses; to ascertain techniques, procedures, and equipment best able to make the soldier operationally effective with respect to optimal climatic protection. To conduct basic and applied research to determine how heat, cold, high terrestrial altitude and work affect the soldier's life processes, performance and health; and to report and advise the Army and the scientific community.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Nonshivering thermogenesis occurring when man becomes cold-acclimatized. (2) Technique for measuring transient heat load through clothing. (3) Telemetry system for physiological measurements in the field. (4) Importance of carnitine in transport and oxidation of fatty acids and helping rats survive in cold. (5) Establishment of relationships among personality factors, catecholamines and cold responses.

CURRENT IMPORTANT EFFORTS: (1) Field study of military performance at altitude. (2) Basic research on pathogenesis of high-altitude pulmonary edema. (3) Establishment of clinical research team on cold injury in Alaska. (4) Series of tasks representative of military activities to permit assessment of military performance. (5) Determination of effects of environmental extremes on intermediary metabolic pathways.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue responsibility for basic and applied research in heat, cold, altitude and physical work. Provide guidance in highly applied problems of protective clothing, e.g., chemical, biological, radiological (CBR). Furnish basis for improved or new doctrine of military operations in environmental extremes. Establish clinical research teams to study climatically induced disabilities.

NAME AND LOCATION: Walter Reed Army Institute of Research (tenant)  
 Walter Reed Army Medical Center, Washington, D.C. 20012  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Colonel William D. Tigertt, MC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	12.034	13.978	14.596
Total in-house RDT&E *	10.201	12.223	12.777
Annual operating cost *	1.174	1.202	1.277
Total RDT&E program	10.796	12.652	13.207
Total procurement program	0	0	0
Total O&M program	1.376	1.339	1.339
Total other programs	0.457	0.416	0.480
Total annual lab. program	12.629	14.407	15.026

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	424	27	215	209
Civilian	438	60	192	246
Total	862	87	407	455

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	353,200	57,500	0	410,700	7.7	7.2

MISSION: To provide medical research and professional graduate training required by the Army to fulfill its role in the national defense. (See paragraph 1, Appendix I, AR 40-4.)

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) New methods of treatment of renal failure. (2) Production of psychosomatic illness in primates. (3) Development and execution of the Medical Research Plan for Southeast Asia. (4) Examination of role of trace metals in enzyme potentiation. (5) Definition of various blood-coagulation defects in disease states.

CURRENT IMPORTANT EFFORTS: (1) To discover methods of treatment for drug-refractory malaria. (2) To establish methods of correction of shock. (3) To define the role of stress on performance. (4) To control acute respiratory disease in recruits. (5) To prepare a variety of vaccines, for example, plague and dengue.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Continue to predict potential manpower losses due to problems of disease and environment. (2) Seek an appropriate solution to (1). (3) Maintain research teams in remote areas. (4) Provide continued graduate instruction for the Medical Service of the Army.

NAME AND LOCATION: U.S. Army Medical Research Unit (tenant)  
 Box 2011, Balboa Heights, Canal Zone 09827  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Lt. Colonel Bryce C. Walton, MSC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.136	0.112	0.125
Total in-house RDT&E *	0.136	0.112	0.125
Annual operating cost *	0.050	0.050	0.050
Total RDT&E program	0.136	0.112	0.125
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	0.136	0.112	0.125

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	10	0	1	4
Civilian	9	0	0	8
Total	19	0	1	12

SPACE AND PROPERTY

Space (square feet)					Cost (in \$ millions)	
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	117,400	2,600	0	120,000	0.250	0.100

MISSION: To conduct research on medical and environmental problems of military importance in Central and South America and in Panama.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Documentation of an outbreak of leptospirosis. (2) The isolation and characterization of chagres virus from patients from the jungle-warfare training center. (3) Documentation of an outbreak of leishmaniasis in military personnel. (4) The linking of bat reservoirs to human histoplasmosis.

CURRENT IMPORTANT EFFORTS: Continuation of projects concerned with a variety of communicable-disease problems within the framework of the assigned mission.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continuation of current efforts.

NAME AND LOCATION: U.S. Army Medical Research Unit (tenant)  
 Institute for Medical Research, Kuala Lumpur, Malaysia  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Lt. Colonel Garrison Rapmund, MC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.136	0.163	0.139
Total in-house RDT&E *	0.089	0.098	0.089
Annual operating cost*	0.027	0.044	0.034
Total RDT&E program	0.089	0.098	0.089
Total procurement program	0.010	0.011	0.007
Total O&M program	0.027	0.044	0.033
Total other programs	0.010	0.010	0.010
Total annual lab. program	0.136	0.163	0.139

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	9	0	4	1
Civilian	0	0	0	0
Total	9	0	4	1

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0.1	2,400	800	1,300	4,500	0.050	0.125

MISSION: To investigate infectious diseases of potential military importance in tropical Asia. Within the scope of research interests, to give diagnostic and epidemiological support to Commonwealth and Malaysian Armed Forces.

PAST SIGNIFICANT ACCOMPLISHMENTS: Extensive investigations of fevers of undetermined origin, scrub typhus and other rickettsial diseases, leptospirosis, and melioidosis.

CURRENT IMPORTANT EFFORTS: Epidemiologic, diagnostic, transmission and control studies of scrub typhus, and ecologic studies of leptospirosis, melioidoasis and malaria. Clinical studies of diarrheal disease of bacterial origin in jungle-dwelling aborigines.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continuation of current effort.

NAME AND LOCATION: U.S. Army Medical Unit  
 Fort Detrick, Frederick, Maryland 21701  
 COMMAND: U.S. Army Medical R&D Command  
 Commanding Officer: Colonel Dan Crozier, MC

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	1.531	1.628	1.721
Total in-house RDT&E *	1.531	1.628	1.728
Annual operating cost *	0.400	0.450	0.495
Total RDT&E program	3.968	3.868	3.868
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	3.968	3.868	3.868

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	255	3	38 *	214
Civilian	98	5	14	79
Total	353	8	52	293

Note: \* Includes 14 M.D.'s and 11 D.V.M's.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
25.9**	78,717	25,900	0	104,617	1.345

Note: \*\*22.0 pasture.

MISSION: To conduct studies related to medical defensive aspects of biological warfare in coordination with the Army Materiel Command, develop biological protective measures, and define appropriate diagnostic and therapeutic procedures for coping with disease induced by those weapons.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Physiometric studies. (2) Dose-response data in man for a number of microorganisms and their by-products. (3) Development and test of selected attenuated and killed vaccines. (4) Development of a battery of tasks for measuring performance decrement induced by infection. (5) Exploration of rapid diagnostic procedures utilizing biophysical, biochemical and immunological techniques.

CURRENT IMPORTANT EFFORTS: Determine illness dose for man of selected potential biological agents (1) before and (2) after immunization. (3) Strengthen defense against those agents by improved methods of mass immunization with specific and broadly protective vaccines. (4) Evaluate antimicrobial products for therapy and chemoprophylaxis against those agents. (5) Develop physical, chemical and physiometric techniques for early diagnosis.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue and expand current efforts toward assessing vulnerability to biological agents; develop appropriate therapeutic and prophylactic measures; develop and apply rapid epidemiological, clinical and laboratory identification techniques; and collect, collate and disseminate the resulting information.

NAME AND LOCATION: U.S. Army Engineer Reactors Group (tenant)  
Fort Belvoir, Virginia

COMMAND: Chief of Engineers  
Commanding Officer: Colonel Kenneth B. Cooper

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	1.2	1.2	1.5
Total in-house RDT&E *	1.2	1.2	1.5
Annual operating cost *	0.2	0**	0
Total RDT&E program	4.5	3.1	3.7
Total procurement program	0.2	0	0
Total O&M program	0	0	0
Total other programs	0.2	0.1	1.3
Total annual lab. program	4.9	3.2	5.0

Note: \*Included in the totals.

\*\*Per DA Cir. 37-25, 1966.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	47	2	47	0
Civilian	107	0	77	30
Total	154	2	124	30

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	21,000	7,000	0	28,000	3.6
					2.8

MISSION: Develop nuclear power plants and devices to supply energy for, and operational requirements of, the Army, the Navy and the Air Force. Provide technical assistance to military users of nuclear power. Maintain technical liaison with the military services and the Atomic Energy Commission to ensure exploitation of new developments in nuclear power. Operate designated plants.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed, built six stationary power plants (1000-3600 kw). (2) Designed, developed other stationary nuclear power plants. (3) Developed experimental facility; developed, tested first closed-cycle gas turbine for nuclear plants. (4) Cost-effectiveness, feasibility and operations-analysis studies of mobile energy-depot system. (5) Developed, built prototype reactor for prototype mobile gas-cooled closed-cycle turbine plant.

CURRENT IMPORTANT EFFORTS: (1) Develop closed-cycle gas turbine. (2) R&D on nuclear power plants and Army R&D reactors. (3) Analytical and experimental support for terrestrial unattended reactor power system (TURPS). (4) Study concept of thermionic or thermoelectric energy-conversion devices in nuclear reactors. (5) Determine feasibility of advanced direct-cycle, boiling-water nuclear reactor and other advanced nuclear-power concepts.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Demonstrate design output of 200- to 300-kwe skid-mounted, closed-cycle, gas-turbine-driven electric power unit. (2) Accelerate technical development of high-power barge-mounted nuclear plants for stability operations. (3) Develop regenerable electrochemical vehicular engines and energy-storage devices. (4) Fabricate, test advanced energy-conversion devices and nuclear or isotopic energy sources. The Atomic Energy Commission will be asked to do major reactor development.

NAME AND LOCATION: U.S. Army Engineer Geodesy, Intelligence and Mapping Research and Development Agency, Fort Belvoir, Virginia

COMMAND: Chief of Engineers

Director: Colonel Hamilton W. Fish, C.E.

Technical Director (Acting): Mr. Gilbert G. Lorenz

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.8	3.2	3.2
Total in-house RDT&E *	2.8	3.2	3.2
Annual operating cost *	0.7	0.8	0.9
Total RDT&E program	7.1	7.0	8.7
Total procurement program	1.6	2.0	1.2
Total O&M program	0.5	0	0
Total other programs	0	0	0
Total annual lab. program	9.2	9.0	9.9

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	10	0	2	8
Civilian	208	4	109	99
Total	218	4	111	107

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
NA	29,767	5,384	1,000	36,151	5.3	3.5

MISSION: To perform R&D of equipment, procedures and techniques in the specific field of geodesy, engineer intelligence and mapping for application to both troop and base-plant operations.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Geodetic satellite system (SECOR) developed and integrated into Army Map Service (AMS) operations. (2) Automatic map-compilation equipment (UNAMACE) delivered. (3) Precise coordinate reader (SACR) delivered. (4) Multiple-station analytical triangulation (MUSAT) program completed. (5) Integration of universal mapping system (UPDRAMS) into AMS operations initiated.

CURRENT IMPORTANT EFFORTS: (1) Development of Advanced Satellite Tracking System (ASTIS) for post-1970 use. (2) Initiation of Automatic Cartographic System development. (3) Application of digital data-handling techniques to mapping. (4) Development of mapping equipment for an all-weather radar system. (5) Automatic Point Transfer Instrument (APTI) being developed.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Conduct R&D on mapping geodesy and geographic information for the DoD. Provide new knowledge in applicable sciences, advance the state of the art in geodetic mapping technology, and develop systems for providing geodetic, mapping and geographic intelligence data essential in missile employment, military combat operations, space exploration, etc.

NAME AND LOCATION: U.S. Army Engineer Waterways Experiment Station  
Vicksburg, Mississippi

COMMAND: Chief of Engineers

Director: Colonel John R. Oswalt, Jr., C.E.

Technical Director: Mr. J. B. Tiffany

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	12.8	14.0	14.3
Total in-house RDT&E *	6.3	7.6	7.6
Annual operating cost *	4.4	4.6	4.8
Total RDT&E program	7.3	9.5	11.3
Total procurement program	3.4	24.2	0
Total O&M program	0.4	0	0
Total other programs	6.4	7.4	7.6
Total annual lab. program	17.5	41.1	18.9

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	31	1	23	8
Civilian	1118	19	306	812
Total	1149	20	329	820

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
1,283	922,300	265,300	795,000	1,282,600	9.4

MISSION: (1) Conduct engineer research, development and investigations in hydraulics, flexible pavements, soils, concrete. (2) Conduct research in nuclear weapons effects, vehicle mobility, and environmental aspects of military operations. (3) Provide division laboratory services to Lower Mississippi Valley Division. (4) Maintain scientific and technical library services.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Solved hydraulic problems concerning waterways, wave-action, tidal estuaries and hydraulic structures. (2) Flood control using Mississippi Basin Model. (3) Determined effects of nuclear weapons on structures, terrain and waterways. (4) Determined effect of environment and terrain on military operations. (5) Tested and evaluated concrete and other materials.

CURRENT IMPORTANT EFFORTS: (1) Hydraulic model studies. (2) Develop expedient surfacings and dust-control materials. (3) Studies to predict soil strength and trafficability. (4) Determine response of structural inclusions in rock to nuclear explosions. (5) Develop design criteria for hydraulic structures, foundations and airfields.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue engineering research, development and investigations in the fields of hydraulics, flexible pavements, soils and concrete. Also continue research in nuclear-weapons effects, vehicle mobility and environmental aspects of military research.

NAME AND LOCATION: U.S. Army Security Agency Processing Center  
Warrenton, Virginia 22186

COMMAND: 1st USASA Field Station

Commanding Officer: Colonel McNear

Technical Director: Captain Thomas H. Tyvand

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.351	0.302	0.302
Total in-house RDT&E *	0.045	0.170	0.170
Annual operating cost *	0	0	0
Total RDT&E program	0.045	0.170	0.170
Total procurement program	0.075	0	0
Total O&M program	0.103	0	0
Total other programs	0.128	0.132	0.132
Total annual lab. program	0.351	0.302	0.302

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	22	0	3	19
Civilian	1	0	0	1
Total	23	0	3	20

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
--	1,800	1,040	--	2,840	0.04	0.350

MISSION: (Information classified.)

PAST SIGNIFICANT ACCOMPLISHMENTS: (Information classified.)

CURRENT IMPORTANT EFFORTS: (Information classified.)

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
(Information classified)

NAME AND LOCATION: 52d U.S. Army Security Agency Special Operations Command (tenant)  
Fort Huachuca, Arizona 85613

COMMAND: U.S. Army Security Agency

Commander: Lt. Colonel Daniel F. Hall

Technical Director: Robert E. Semelsberger

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.205	0.710	0.717
Total in-house RDT&E*	0.214	0.472	0.497
Annual operating cost*	0	0	0
Total RDT&E program	0.214	0.472	0.497
Total procurement program	0	0	0
Total O&M program	0.731	0.238	0.220
Total other programs	0.260	0.617	0.617
Total annual lab. program	1.205	1.327	1.334

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	192	0	18	174
Civilian	16	0	6	10
Total	208	0	24	184

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
37.9	9,300	10,700	/69,000/	89,000	1.013	0.997

MISSION: To plan, conduct, supervise, coordinate and report on engineering and service tests and evaluation of equipment, systems, organizational and operational concepts and doctrine, plus such other tests as are directed. Perform vulnerability and ELSEC (electronic security) tests of electronic equipment in support of other U.S. Army elements.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Tested and evaluated new and prototype equipment as assigned by the Army Security Agency (ASA), such as AN/GLQ-6, AN/TRD-16, AN/TLA-7, AN/TLQ-15, AN/GLQ-3 and AN/TRD-22. (2) Jointly tested with the U.S. Marine Corps the AN/TSQ-17. (3) Operated two CONUS (continental U.S.) APC teams. (4) Supported three ELSEC projects. (5) Supported seven vulnerability projects.

CURRENT IMPORTANT EFFORTS: Current efforts include testing, evaluating and reporting: (1) CM receiver AN/TLR-15. (2) COMCM (communications CM) assemblies (unattended) expendable units. (3) Linear disposed antenna array. (4) Continuous operation of two CONUS APC teams. (5) Vulnerability and ELSEC R&D support to the U.S. Army.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: To continue assigned test and evaluation activities in the ASA's RDT&E program and support the U.S. Army vulnerability program.

NAME AND LOCATION: U.S. Army Materials Research Agency  
Watertown, Massachusetts

COMMAND: Headquarters, U.S. Army Materiel Command (AMC)

Commanding Officer: Colonel D. A. Kellogg

Technical Director: Dr. J. L. Martin

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	8.195	9.100	9.492
Total in-house RDT&E *	7.410	8.140	8.625
Annual operating cost*	1.463	2.470	2.730
Total RDT&E program	7.416	8.260	8.790
Total procurement program	3.831	3.850	3.850
Total QRM program	0.765	0.820	0.825
Total other programs	0.020	0.042	0.042
Total annual lab. program	12.032	12.972	13.507

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	5	4	4	1
Civilian	668	20	180	488
Total	673	24	184	489

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	285,000	15,000	0	300,000	8.0
					19.0

MISSION: Manages and directs the AMC Materials Research Program conducted within its own laboratories, as assigned by the Director of Research and Laboratories, Headquarters, AMC, including basic scientific research and research in metals, ceramics and other materials. Coordinates the total Materials Research Program of the AMC.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) R&D of steel, uranium and titanium alloys for compact nuclear devices. (2) Theoretical and experimental buckling design criteria for missiles and airframes. (3) Control of metal quality by nondestructive testing techniques. (4) Lightweight armor. (5) Theories and techniques to control brittle fracture of metals.

CURRENT IMPORTANT EFFORTS: (1) Development of improved armor through composite approaches. (2) Solid state studies of the influence of bonding electrons on electrical and mechanical properties. (3) R&D of the mechanics of materials to permit efficient design. (4) The physical metallurgy of metals and ceramics. (5) Improved nondestructive testing, using imaging techniques.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: R&D of high-strength, tougher, corrosion- and wear-resistant materials of all types to extend weapons and transportation capability.

NAME AND LOCATION: U.S. Army Coating and Chemical Laboratory (tenant)

Aberdeen Proving Ground, Maryland

COMMAND: Headquarters, U.S. Army Materiel Command (AMC)

Commanding Officer: Colonel Charles D.Y. Ostrom, Jr.

Technical Director: Dr. Charles F. Pickett

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.079	1.150	1.170
Total in-house RDT&E *	0.948	0.837	0.863
Annual operating cost*	0.119	0.141	0.120
Total RDT&E program	1.723	1.747	1.777
Total procurement program	0.099	0.095	0.095
Total O&M program	0.062	0.062	0.062
Total other programs	0.014	0.016	0.016
Total annual lab. program	1.898	1.920	1.950

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	7	2	2	5
Civilian	52	3	28	24
Total	59	5	30	29

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
0	15,054	2,720	17,172	34,946	0.2	0.3

MISSION: Conduct basic and applied research and engineering investigations and give technical assistance in automotive chemicals, organic and semiorganic coatings, conversion coatings, cleaners, fuels, lubricants and related materials. Coordinate AMC program in fuels and lubricants. Participate in standardization and industrial preparedness in these fields.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed: (1) Heavy-duty operational engine oil with sludge and rust protection. (2) Dimensional technique for analyzing performance of detergent. (3) Intumescent coating for protection of special weapon systems. (4) Gas chromatograph technique for analysis of coating materials. (5) Operational preservative fluid for hydraulic brake systems.

CURRENT IMPORTANT EFFORTS: Development of: (1) Solar-heat-reflective and low-visibility enamel. (2) All-weather hydraulic brake fluid. (3) Improved corrosion inhibitor for antifreeze. (4) Biodegradable detergent compositions for cleaners and paint stripping compounds. (5) Engine-preservative oil with heavy-duty operational characteristics.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: To develop new and improved materials for pretreating and finishing military equipment to provide maximum protection against corrosion, as well as other military characteristics, i.e. camouflage, color, chemical resistance, etc. To develop new and improved fuels and lubricants for maximum performance and minimum wear under all types of operating conditions.

NAME AND LOCATION: U.S. Army Electronics Laboratories  
 Fort Monmouth, New Jersey  
 COMMAND: U.S. Army Electronics Command (ECOM)  
 Commanding Officer: Brig. General W. B. Latta (ECOM)  
 Technical Director: Dr. H. K. Ziegler (ECOM)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	57.687	58.200	61.000
Total in-house RDT&E *	54.358	55.076	58.031
Annual operating cost*	7.773	7.851	8.591
Total RDT&E program	125.831	126.300	129.000
Total procurement program	0.237	0.250	0.250
Total O&M program	0.699	0.700	0.700
Total other programs	2.630	2.021	2.110
Total annual lab. program	129.397	129.271	132.060

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	148	9	121	27
Civilian	3,354	68	1,557	1,797
Total	3,502	77	1,678	1,824

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
515	320,536	128,214	/467,166/	915,916	15.0	69.0

MISSION: Perform research in all fields related to military electronics.

Develop new materials, techniques and designs for components, equipment and systems for communications, automatic data processing, surveillance, night vision, avionics, electronic warfare, meteorology and related fields.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Development of pulse code modulation for voice security over multiple telephone trunk circuits. (2) Extremely fine-grain ceramics for miniature stable capacitors and microwave resonators and isolators. (3) Surveillance system for day/night, passive, air-to-ground reconnaissance. (4) Small starlight scope for night viewing. (5) Novel seismic transducers for combat-area surveillance.

CURRENT IMPORTANT EFFORTS: (1) Tactical automatic switching system for field Army. (2) Fuel cells for new power sources. (3) Omnidirectional mortar locator. (4) Night-vision goggles. (5) Avionics package for night observation helicopters.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Support Project MALLARD; accelerate introduction of microelectronics into Army equipment and systems; provide visipanel--a single, simple all-purpose night-vision system; research on electromagnetic and acoustic-seismic signals; provide Army air mobility in conditions of poor visibility.

NAME AND LOCATION: Electronics Research and Development Activity (tenant)  
White Sands, New Mexico

COMMAND: U.S. Army Electronics Command (ECOM)  
Commanding Officer: Lt. Colonel Herbert D. Harback, ERDA  
Technical Director: Dr. H. K. Ziegler (ECOM)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	7.351	7.200	7,840
Total in-house RDT&E *	7.110	6.904	7,660
Annual operating cost *	1,325	1,144	1,900
Total RDT&E program	9.053	9.150	9,600
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.241	0.254	0.242
Total annual lab. program	9.294	9.404	9,842

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	248	1	1	247
Civilian	296	5	231	65
Total	544	6	232	312

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	45,993	42,543	9,321	97,857	4.0	25.0

MISSION: (U) Perform research in fields of missile EW (electronic warfare) vulnerability and surveillance; environmental sciences, including meteorology; electronic data processing and missile range instrumentation leading to development of equipment, systems, techniques and devices. Provide range support to ECOM R&D laboratories.

PAST SIGNIFICANT ACCOMPLISHMENTS: (U) (1) Prediction of impact point of unguided rockets. (2) Atmospheric time and space variability study. (3) Stratospheric and mesospheric circulation studies. (4) Demonstration of vulnerability of missiles to ECM (electronic countermeasures) techniques, causing target miss in five successive firings. (5) Electronic counter-countermeasures (ECCM) recommendations to missile-system project managers.

CURRENT IMPORTANT EFFORTS: (U) (1) Investigation of a large diurnal variation in the stratosphere. (2) Radar pibal (pilot-balloon) tracker. (3) Real-time prelaunch rocket-impact prediction. (C) (4) Assess vulnerability of all Army SAMS (surface-to-air missiles) to ECM for input to Army Chief of Staff study. (5) Provide VHF/UHF radar measurements on high-speed reentry bodies.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (U) (1) Local weather modification. (2) Local atmospheric effects on communication detection and tracking techniques. (3) Determine vulnerability of all Army missiles to ECM and recommend ECCM to reduce vulnerability. (4) Analyze foreign missile systems as basis for developing ECM for field Army.

NAME AND LOCATION: U.S. Army Development and Proof Services  
Aberdeen Proving Ground, Maryland

COMMAND: U.S. Army Test and Evaluation Command  
Commanding Officer: Colonel George C. Clowes

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	26,700	27,488	29,470
Total in-house RDT&E *	11,159	11,633	13,495
Annual operating cost *	2,530	2,774	2,890
Total RDT&E program	29,938	30,500	32,600
Total procurement program	22,451	22,500	22,500
Total O&M program	3,673	3,675	3,690
Total other programs	1,310	0,925	0,895
Total annual lab. program	57,372	57,600	59,685

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	503	3	51	452
Civilian	2,634	1	403	2,231*
Total	3,137	4	454	2,683

Note: \*Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
69	0	122,000	7880,020	1,002,020	26.0	32.0

MISSION: Conduct all types of engineer design and engineering tests on weapons, ammunition, munitions, fire-control equipment, combat vehicles and automotive materiel.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Automated electrodynamic vibration system for ammunition testing. (2) Modernized rain test facility. (3) Dynamic weapon-performance instrumentation. (4) Military potential of IFAWG (Interim Forward-Area Weapons Group) system. (5) Engineering test of UET (universal engineer tractor).

CURRENT IMPORTANT EFFORTS: (1) Improved environmental simulation facility. (2) Dynamic ballistic-data-acquisition system coupled to telemetry-receiving ground station and analog/digital conversion for dynamic weapon-performance testing. (3) Roadability of self-propelled HAWK and fire-direction system AN/TSQ-51. (4) Engineering test of Vulcan and projectile XM246 (new pyrotechnic self-destruct fuze). (5) Life firing test of 105mm howitzer M102.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Subactivity does not operate laboratories subject to regulatory control under R&D programming. Statement of current important efforts indicates future year's activity, understated to comply with limitations of this submission. A firm effort will be made to engineer and develop test instrumentation, facilities and methodology needed to satisfy current and future requirements for test and evaluation.

NAME AND LOCATION: Army Infantry Board (tenant)  
Fort Benning, Georgia

COMMAND: U.S. Army Test and Evaluation Command  
President: Colonel James I. Muir, Jr.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.490	1.274	1.284
Total in-house RDT&E*	0.697	0.648	0.658
Annual operating cost*	0.202	0.186	0.193
Total RDT&E program	0.744	0.730	0.740
Total procurement program	0	0	0
Total O&M program	0.021	0	0
Total other programs	0.772	0.626	0.626
Total annual lab. program	1.537	1.356	1.366

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	194	0	0	194
Civilian	33	0	0	33
Total	227	0	0	227

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	70,285	1,750	72,035	0.598	0.613

MISSION: Plan, conduct and report on service, military-potential, check and confirmatory tests related to suitability of equipment for Army use. Conduct and/or participate in engineering and research studies, as directed and determined by service-oriented capabilities. Participate in troop tests. Provide advice to developers of Infantry equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Instrumented moving-target assembly. (2) Instrumentation for small-arms test facility. (3) Use of telemetric transmitters and receivers. (4) Service test of starlight scopes. (5) Study of small-arms weapon systems (SAWS).

CURRENT IMPORTANT EFFORTS: (1) Develop moving-target transporters and acoustic miss-distance indicator signal conditioning equipment. (2) Install microwave relay system. (3) Acquire automatic data-acquisition and -processing system. (4) Confirmatory I test of starlight scopes. (5) Engineering-development test of special-purpose individual weapon (SPIW).

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Army Airborne, Electronics and Special Warfare Board  
 Fort Bragg, North Carolina  
 COMMAND: U.S. Army Test and Evaluation Command  
 President: Colonel James M. S. Strickland

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.671	3.044	3.081
Total in-house RDT&E *	1.811	1.837	1.874
Annual operating cost *	0.269	0.253	0.253
Total RDT&E program	1.811	1.837	1.874
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.860	1.207	1.207
Total annual lab. program	2.671	3.044	3.081

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	173	0	109	64
Civilian	46	0	38	8
Total	219	0	147	72

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	0	357,550	/103,024/	460,574	0

MISSION: Plan and conduct service tests and required check and confirmatory tests. Participate in engineer design, engineering and environmental tests. Participate in the planning, supervision and monitoring of troop tests. Provide advice to developers of airborne, electronic and special-warfare equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Employment of high-speed motion-picture cameras. (2) Use of aircraft loader equipment. (3) Refinement of airdrop test bed. (4) Airdrop of REDEYE. (5) Engineering/service test of AN/PPS-5 short-range surveillance radar.

CURRENT IMPORTANT EFFORTS: (1) Acquire rough-terrain loader. (2) Develop and use articulated anthropomorphic dummies for parachute drop tests. (3) Air-transportability testing of Vulcan, Chapparal and self-propelled HAWK. (4) Service test of RT841/PRC77 receiver-transmitter. (5) Service test of XM733 full-track assault vehicle.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.).

NAME AND LOCATION: Army Air Defense Board (tenant)

Fort Bliss, Texas

COMMAND: U.S. Army Test and Evaluation Command

President: Colonel William W. Saunders

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	4,641	4,460	4,531
Total in-house RDT&E *	2,351	2,414	2,485
Annual operating cost *	0.667	0.685	0.710
Total RDT&E program	2,882	2,890	2,900
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	2,290	2,046	2,046
Total annual lab. program	5,172	4,936	4,946

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	340	0	0	340
Civilian	106	0	34	72
Total	446	0	34	412

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	44,186	34,438	180,432	159,058	2.0	16.0

MISSION: Plan and conduct service, military-potential, check and confirmatory tests. Participate in the planning and conduct of engineering/service tests. Provide advice to developers of air defense equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Implementation of advanced cinetheodolite system. (2) Establishment of in-house calibration capability. (3) Service test of NIKE-HERCULES Mobile HIPAR and radar simulator AN/MPQ-T1. (4) Military-potential test of IFAWG (Interim Forward-Area Weapons Group) system. (5) Service test of Hawaiian Air Defense AN/FSQ-38 and HAWK HPI (high-powered illuminator) with built-in test equipment.

CURRENT IMPORTANT EFFORTS: (1) Acquisition of airborne miss-distance indicator system. (2) Installation of microwave (UHF) telemetry system. (3) Service test of REDEYE missile system and self-propelled HAWK. (4) Confirmatory test of Mobile HIPAR. (5) Service test of fire-direction system AN/TSQ-51; battery terminal equipment; Chapparal missile and Vulcan gun system; and NIKE-X system.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: U.S. Army Arctic Test Center (tenant)

Fort Greely, Alaska

COMMAND: U.S. Army Test and Evaluation Command

Commanding Officer: Colonel James A. Wiley

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	4.606	4.265	4.315
Total in-house RDT&E *	2.706	2,820	2,870
Annual operating cost *	1.811	1,693	1,695
Total RDT&E program	2.764	2,900	2,900
Total procurement program	0.033	0.035	0.035
Total O&M program	0.007	0.010	0.010
Total other programs	2.102	1,609	1,609
Total annual lab. program	4.906	4,554	4,554

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	450	0	365	85
Civilian	33	1	5	28
Total	483	1	370	113

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Total building	Real property	Cost (in \$ millions)	Equipment
0	2,880	30,172	7286,988/	320,043	NA	5.0	

MISSION: Plan and conduct environmental phases of engineering, service and integrated engineering-service tests, evaluations, check and confirmatory tests. Participate in and monitor troop tests as directed.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Implementation of modern vehicle-weighing system. (2) Improved procedures for out-of-house calibration. (3) Service tests of Block I REDEYE. (4) Engineering/service tests of arctic phase of XM561,  $\frac{1}{2}$ -ton truck. (5) Engineering/service tests of 105mm cartridge, white-phosphorus M116.

CURRENT IMPORTANT EFFORTS: (1) Establishment of a limited electronic instrumentation support facility. (2) Confirmatory test of Block III REDEYE. (3) Engineering/service tests of arctic phase of XM551 armored reconnaissance/airborne assault vehicle (AR/AAV). (4) Confirmatory I test of CH-47A helicopter. (5) Engineering-development test of TOW antitank missile.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Army Armor and Engineer Board (tenant)

Fort Knox, Kentucky

COMMAND: U.S. Army Test and Evaluation Command

President: Colonel Emett R. White

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	3.105	3.389	3.424
Total in-house RDT&E *	1.519	1.527	1.558
Annual operating cost *	0.269	0.253	0.253
Total RDT&E program	1.538	1.540	1.570
Total procurement program	0.088	0.085	0.090
Total O&M program	0.027	0.025	0.025
Total other programs	1.552	1.831	1.831
Total annual lab. program	3.205	3.481	3.516

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	361	0	0	361
Civilian	94	0	54	40
Total	455	0	54	401

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	6,200	57,348	/139,998/	203,546	0.715
					5.0

MISSION: Plan, conduct and report on service, check and confirmatory tests. Participate in engineer design, engineering and environmental tests. Participate in the planning, supervising and monitoring of troop tests.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Use of target-acquisition camera system, mobile dynamometer and direct-reading pyrometer. (2) Service test of UET (universal engineer tractor) retrofit. (3) Service test of XM656 5-ton truck. (4) Service test of XM561  $\frac{1}{4}$ -ton truck. (5) Service test of XM551 armored reconnaissance/airborne assault vehicle (AR/AAV).

CURRENT IMPORTANT EFFORTS: (1) Employment of camera systems for still and high-speed motion-picture photography. (2) Service test of XM733 full-tracked amphibious assault vehicle. (3) Military potential of XM706 armored car cupola. (4) Service test of 105mm cartridge, antipersonnel XM494E2. (5) Service test of tank M60A1E1.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Army Artillery Board (tenant)  
Fort Sill, Oklahoma

COMMAND: U.S. Army Test and Evaluation Command  
President: Colonel James E. Norvell

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.493	1.548	1.553
Total in-house RDT&E *	0.568	0.578	0.581
Annual operating cost*	0.198	0.211	0.211
Total RDT&E program	0.578	0.580	0.585
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.915	0.968	0.968
Total annual lab. program	1.493	1.548	1.553

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	229	0	190	39
Civilian	28	0	2	26
Total	257	0	192	65

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	21,077	/37,511/	58,588	NA	NA

MISSION: Plan, conduct and report on service, check, confirmatory and other tests. Participate in and monitor troop tests. Participate in engineer design and engineering tests. Provide advice to developers of field-artillery equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Introduction of electronic calculators for ballistic measuring system. (2) Use of oscilloscope in electronic testing shop. (3) Compatibility test of XM119E4 propelling charge with 155mm self-propelled howitzer M109. (4) Service test of wear-reducing additive for 175mm gun. (5) Check test of laser rangefinder XM23.

CURRENT IMPORTANT EFFORTS: (1) Replacement of T-7 chronograph with M36 chronograph. (2) Installation of radio data link for burst-time indicator. (3) Use of Tellurometer for surveying. (4) Compatibility test of XM119E4 propelling charge with 155mm self-propelled howitzer. (5) Confirmatory II test of 105mm howitzer M102.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: U.S. Army Aviation Test Activity (tenant)  
Edwards Air Force Base, California

COMMAND: U.S. Army Test and Evaluation Command  
Commanding Officer: Colonel Karl H. Zornig

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.142	2.198	2.390
Total in-house RDT&E*	1.557	1.676	1.868
Annual operating cost *	0.191	0.147	0.103
Total RDT&E program	1.768	1.887	2.079
Total procure. : program	0	0	0
Total O&M program	0.133	0.135	0.135
Total other programs	0.452	0.387	0.387
Total annual lab. program	2.353	2.409	2.501

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	64	0	0	64
Civilian	103	0	65	38
Total	167	0	65	102

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Total building	Cost (in \$ millions)
0	25,000	18,000	/100,000/	143,000	NA 7.0

MISSION: Conduct engineering and other tests of Army aviation equipment. Participate in research flight testing. Collaborate with the Air Force, the Navy and the Federal Aviation Agency during aircraft development.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Acquisition of high-speed motion-picture cameras. (2) Use of standardized airborne instrumentation and recording packages. (3) Phase-B and -D tests of UH-1B/540 helicopter. (4) Engineering test of YOH-6 helicopter. (5) Engineering test of XV-5A V/STOL aircraft.

CURRENT IMPORTANT EFFORTS: (1) Provision of low-frequency vibration-measuring instrumentation. (2) Development of dynamic torque-measuring instrument. (3) Compatibility of Mohawk radar surveillance system with aircraft. (4) Determination of flying qualities of V/STOL aircraft. (5) Engineering test of CH-47 armament ship.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Army Aviation Test Board (tenant)  
Fort Rucker, Alabama

COMMAND: U.S. Army Test and Evaluation Command  
President: Colonel Raymond E. Johnson

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	5.798	5.915	5.937
Total in-house RDT&E *	3.454	3.463	3.485
Annual operating cost *	0.488	0.470	0.470
Total RDT&E program	5.368	5.385	5.400
Total procurement program	0.002	0	0
Total O&M program	1.306	1.531	1.531
Total other programs	1.038	0.921	0.921
Total annual lab. program	7.714	7.837	7.852

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	259	0	0	259
Civilian	179	0	78	101
Total	438	0	78	360

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
0	5,430	191,712	/328,362/	525,504	0	0.125

MISSION: Plan and conduct service (Phase E), logistical evaluation (Phase F), check and confirmatory type I tests of aircraft, aircraft components, and subsystems and ancillary equipment. Provide advice to developers of Army aviation materiel.

PAST SIGNIFICANT ACCOMPLISHMENTS: Acquisition of spectrometer for oil-sample analysis. (2) Logistic evaluation of CH-47A helicopter. (3) Logistic evaluation of UH-1B/540 helicopter. (4) Service test of CV-7A Buffalo aircraft. (5) Product-improvement test of UH-1B/540 helicopter.

CURRENT IMPORTANT EFFORTS: (1) Installation of automated data-acquisition and processing system. (2) Acquisition of infrared test equipment for Mohawk system testing. (3) Engineering/service test of Mohawk radar surveillance system. (4) Service test of air-mobile aircraft-refueling system. (5) Logistic evaluation of CH-47A helicopter.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Dugway Proving Ground  
 Dugway, Utah  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding Officer: Colonel Joseph J. Fraser, Jr.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	15,452	16,603	17,401
Total in-house RDT&E *	12,735	13,210	14,505
Annual operating cost *	5,175	5,155	5,248
Total RDT&E program	14,900	15,000	16,000
Total procurement program	0	0	0
Total O&M program	1,658	2,057	1,560
Total other programs	1,059	1,336	1,336
Total annual lab. program	17,617	18,393	18,896

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	426	9	112	314
Civilian	1006	2	456	550 *
Total	1432	11	568	864

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
797,479	280,919	11,791	1,937,992	1,230,702	47.0      10.0

MISSION: Plan, conduct and participate in tests of chemical, biological and radiological (CBR) munitions and agents; investigations in CBR, meteorological, ecological, and epidemiological fields, furthering safety capability and defense mechanisms essentially prerequisite to field testing of CBR materiel.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Use of advanced mobile cinétheodolite. (2) Use of advanced mobile tracking telescope (cine-sextant). (3) Engineering test of water-drinking and resuscitation device for M17 field protective mask. (4) Special study of E159, CS cluster. (5) Engineering-development test of personnel detector.

CURRENT IMPORTANT EFFORTS: (1) Implementation of a modern, effective target-acquisition system. (2) Design and acquisition of an automated agent-sampling and -analysis system. (3) Engineering/service test of hand-held one-shot flame projector. (4) Service test of E159, CS cluster. (5) Provide test support to Deseret Test Center.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: U.S. Army Electronics Proving Ground  
 Fort Huachuca, Arizona  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding General: Maj. General B. H. Pochyla

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	27.034	26.175	27.367
Total in-house RDT&E *	14.989	15.994	17.117
Annual operating cost*	6.270	7.239	8.232
Total RDT&E program	20.294	21.300	23.400
Total procurement program	0.823	0.825	0.825
Total O&M program	3.216	3.220	3.300
Total other programs	8.024	6.136	6.125
Total annual lab. program	32.357	31.481	33.650

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1,466	3	3	1,463
Civilian	1,459	2	218	1,241*
Total	2,925	5	221	2,704

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
58,838	14,575	305,816	/1,005,552/	1,325,943	180.0	100.0

MISSION: Operate an electromagnetic environmental test facility, an electronic countermeasures vulnerability test facility, and a systems test facility. Plan, conduct, evaluate and report on engineering tests of communications-electronic equipment and systems. Plan, conduct, evaluate and report on service tests of communications-electronic equipment and systems used above the division level.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Design and operation of facilities for frequency monitoring, spatial resolution and antenna testing. (2) Design and operation of standards testing and calibration facility. (3) Engineering design test of long-range survey system. (4) Test of medium-channel-capacity Army area communications system. (5) Engineering/service test of AN/PPS-5 short-range surveillance radar.

CURRENT IMPORTANT EFFORTS: (1) Design and acquisition of mobile calibration system. (2) Acquisition of targets of variable cross section for radar MTI (moving-target indicator). (3) Engineering test of low-channel-capacity Army area communications system (AACS). (4) Military-potential test of KY 28 in selected tactical communications assemblages. (5) Service test of RT841/PRC97 receiver-transmitter.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Subactivity does not operate laboratories subject to regulatory control under R&D programming. Statement of current important efforts indicates future year's activity, understated to comply with limitations of this submission. A firm effort will be made to engineer and develop test instrumentation, facilities and methodology needed to satisfy current and future requirements for test and evaluation.

NAME AND LOCATION: U.S. Army General Equipment Test Activity (tenant)  
 Fort Lee, Virginia  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding Officer: Colonel Carl E. Bledsoe

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.390	3.496	3.537
Total in-house RDT&E*	2.470	2.589	2.625
Annual operating cost*	0.540	0.532	0.525
Total RDT&E program	2.472	2.590	2.630
Total procurement program	0.030	0.030	0.030
Total O&M program	0.063	0.065	0.070
Total other programs	0.857	0.842	0.842
Total annual lab. program	3.422	3.527	3.572

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	255	0	12	243
Civilian	155	1	81	74 *
Total	410	1	93	317

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)				Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	111,633	95,688	20,998	228,319	0	2.0

MISSION: Plan, conduct and report on engineering tests of equipment for general use throughout the Army; and service, check, military-potential and confirmatory tests and evaluations of equipment used by technical support units. Plan, conduct, and report on LOTS (logistical over-the-shore) and movement adaptability tests.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Establish and operate an in-house calibration system. (2) Transportability testing of NIKE-HERCULES Mobile HIPAR. (3) Service test of forklift, 4000 pounds. (4) LOTS test of XM551 armored reconnaissance/airborne assault vehicle (AR/AAV). (5) Engineering test of spike-resistant insole and boots.

CURRENT IMPORTANT EFFORTS: (1) Install an automated weather station. (2) Acquire an automated fuel-analysis system. (3) Transportability test of fire-direction system AN/TSQ-51, Vulcan gun system, Chapparal gun system, self-propelled HAWK. (4) Confirmatory II test of LARC XV. (5) LOTS test of MBT 70.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Jefferson Proving Ground  
 Madison, Indiana  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding Officer: Colonel John R. Bailey, Jr.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	4.813	3.328	3.328
Total in-house RDT&E *	0.297	0.300	0.300
Annual operating cost *	2.800	2.800	2.800
Total RDT&E program	0.297	0.300	0.300
Total procurement program	1.488	0.071	0.100
Total O&M program	3.000	3.000	3.000
Total other programs	0.028	0.028	0.028
Total annual lab. program	4.813	3.399	3.428

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military				
Civilian				
Total		(No RDT&E PERSONNEL)		

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
55,264	0	76,850	878,926	955,776	26.0	4.0

MISSION: Plan, conduct and report on ballistic acceptance, production engineering, surveillance and other tests of ammunition. Plan, direct and control a research and development program for test instrumentation, facilities and methodology needed to satisfy current and future testing requirements.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Installation of closed-circuit TV for ammunition assembly plant. (2) Use of synchronous ballistic camera for projectile in-flight surveillance. (3) Engineering/service test of 105mm cartridge, XM546. (4) Joint Environmental Effects Program. (5) Continuous testing of production lots of ammunition.

CURRENT SIGNIFICANT EFFORTS: (1) Automated systems for projectile-velocity data transmission, recording and reduction. (2) Photometric instrumentation for testing photoflash and signal items. (3) Strain patch and piezoelectric equipment for dynamic weapons testing. (4) Engineering/service test of 105mm cartridge XM546. (5) Continuous testing of production lots of ammunition.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: U.S. Army Tropic Test Center (tenant)  
 Drawer 942, Fort Clayton, Canal Zone  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding Officer: Colonel Pedro R. FlorCruz

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.146	1.051	1.095
Total in-house RDT&E *	0.820	0.873	0.878
Annual operating cost *	0.111	0.110	0.108
Total RDT&E program	1.279	1.330	1.335
Total procurement program	0.003	0.003	0.003
Total O&M program	0.003	0.003	0.002
Total other programs	0.323	0.175	0.215
Total annual lab. program	1.608	511	1.555

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	43	0	0	43
Civilian	46	4	25	21
Total	89	4	25	64

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	10,000	37,000	/3,210,000/	3,257,000	NA

MISSION: Plan and conduct environmental phases of engineering, service, integrated engineering-service tests; evaluation; check and confirmatory tests. Arrange for and coordinate the utilization of facilities, equipment and services required in support of tropic environmental tests conducted by other agencies.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Improved procedures for out-of-house calibration. (2) Improved meteorological-data-collection capability. (3) Tropic storage of REDEYE. (4) Tropic environmental service test of AN/VRC-12 radio. Product-improvement test of collapsible 2-quart canteen.

CURRENT IMPORTANT EFFORTS: (1) Establishment of an in-house calibration capability. (2) Expanded capability for testing vehicles and armament. (3) Tropic environmental test of Vulcan, self-propelled HAWK, and Chapparal. (4) Joint Environmental Effects Program. (5) Tropic service test of lightweight body armor.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: White Sands Missile Range  
 White Sands, New Mexico  
 COMMAND: U.S. Army Test and Evaluation Command  
 Acting Commander: Colonel Karl F. Eklund

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	87,540	87,458	90,393
Total in-house RDT&E*	72,391	74,247	77,132
Annual operating cost*	6,833	7,215	7,857
Total RDT&E program	90,097	92,600	95,800
Total procurement program	2,168	2,150	2,150
Total O&M program	1,883	1,900	1,900
Total other programs	11,098	9,161	9,211
Total annual lab. program	105,246	105,811	109,061

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1618	3	594	1024
Civilian	3868	4	1500	2368 *
Total	5486	7	2094	3392

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
166.452	1,327,285	303,889	/3,877,469/	4,508,643	128.0	339.0

MISSION: Operate a national missile range. Engineer and develop range instrumentation and facilities. Test Army air defense rocket and guided-missile systems. Operate a nuclear-effects facility.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Establishment of a nuclear-effects testing capability. (2) Improved data handling and reduction through use of dual direct-coupled computer system. (3) Engineering test of REDEYE missile system; NIKE-HERCULES Mobile HIPAR; radar simulator AN/MPQ-T1. (4) ATHENA, SPRINT, gun probe and Air Force supersonic drop tests. (5) Support of GEMINI missions.

CURRENT IMPORTANT EFFORTS: (1) Develop and install the advanced range testing and control system (ARTRAC). (2) Engineer and implement a highly advanced near-launch tracking system. (3) Engineer test of fire-direction system AN/TSQ-51. (4) Service test of battery terminal equipment. (5) Engineering test of REDEYE test set, NIKE-X, self-propelled HAWK, and improved HAWK.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Yuma Proving Ground  
 Yuma, Arizona  
 COMMAND: U.S. Army Test and Evaluation Command  
 Commanding Officer: Colonel Joe C. Cullen

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	8.528	9,033	9,711
Total in-house RDT&E *	6.774	6,429	7,102
Annual operating cost *	4,579	4,239	4,352
Total RDT&E program	8,062	8,100	8,200
Total procurement program	2,705	2,700	2,750
Total O&M program	0,431	0,450	0,450
Total other programs	1,873	1,754	1,709
Total annual lab. program	13,071	13,004	13,109

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	300	?	6	294
Civilian	790	0	77	713 *
Total	1090	2	83	1007

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
891,286	244,000	32,500	/1,128,843/	1,405,348	27.0	2.0

MISSION: Plan, conduct, record and report the results of engineering tests of air-delivery materiel and long-range tube artillery; and support air-delivery tests; plan, conduct and support desert environmental tests; support arctic environmental tests.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Use of gas chromatograph. (2) Improved system for truck/aircraft cargo unloading and loading. (3) Modernization and increased flexibility of cinetheodolite system. (4) Employment of 5,000-pound dynamometer for absorption vehicle. (5) Engineer design test of projectile, 175mm white phosphorus XM510E1.

CURRENT IMPORTANT EFFORTS: (1) Employment of special-purpose x-ray to detect fuze-arming action. (2) Improved missile-acquisition system. (3) Adoption of infrared spectrophotometer to determine organic contaminates in liquids. (4) Acquisition of field dynamometer truck. (5) Desert service test of AN/PRT-4 and AN/PRR-9 squad radios.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (Same as on page 26.)

NAME AND LOCATION: Research and Development Directorate  
Redstone Arsenal, Alabama 35809

COMMAND: U.S. Army Missile Command  
Commanding General: Major General John Zierdt  
Technical Director: John McDaniel

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	72,904	74,100	80,000
Total in-house RDT&E*	42,809	43,873	48,125
Annual operating cost*	6,765	6,765	6,765
Total RDT&E program	110,378	124,192	132,500
Total procurement program	0,300	0,300	0,400
Total O&M program	0,070	0,070	0,080
Total other programs	39,281	42,350	46,000
Total annual lab. program	156,029	166,912	178,980

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	55	13	16	39
Civilian	1704	29	936	768
Total	1759	42	952	807

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
11,550	1,054,539	324,880	1334,971	1,714,390	32.0

MISSION: (U) Plan, direct, accomplish and supervise materiel-development programs and projects not selected for project management. Plan, manage, conduct and/or direct basic and applied research projects. Initiate and perform research and component development to generate new technology and perform feasibility and design studies for future weapon systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: This information is CLASSIFIED.

CURRENT IMPORTANT EFFORTS: This information is CLASSIFIED.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (U) To exercise control over all programs, projects or tasks to meet future Army materiel objectives in assigned commodity areas. To initiate, direct and execute appropriate analytical design, evaluation, research and component-development programs. To ensure that optimum missile systems are synthesized and prepared for development.

NAME AND LOCATION: U.S. Army Human Engineering Laboratories (tenant)  
Aberdeen Proving Ground, Maryland  
COMMAND: Headquarters, U.S. Army Materiel Command  
Commanding Officer: Colonel C.D.Y. Ostrom, Jr.  
Technical Director: Dr. John D. Weisz

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.142	2.290	2,300
Total in-house RDT&E *	1,529	1,585	1,696
Annual operating cost *	0.422	0.478	0.489
Total RDT&E program	2.116	2,285	2,350
Total procurement program	0.080	0.080	0.080
Total O&M program	0.032	0.035	0.035
Total other programs	0.105	0.135	0.135
Total annual lab. program	2,333	2,535	2,600

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	29	2	14	15
Civilian	160	10	84	76
Total	189	12	98	91

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	48,000	20,000	12,000	80,000	0.500	1.0

MISSION: Perform human-factors research to determine capabilities and limitations of man. Assist project managers and subordinate commands to design materiel that is simple to operate, easy to maintain, and highly effective in combat.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Human-factors design handbooks published for Army materiel. (2) Human design parameters determined for small arms. (3) Human performance data derived for antitank-weapon-system gunners, armored infantry personnel and air-to-ground observers. (4) Significant research results obtained in human audition. (5) Design criteria for human tolerance of muzzle and breech blast.

CURRENT IMPORTANT EFFORTS: (1) Study of performance of men in stressful, combat-like experimental situations. (2) Research in areas of night vision, audition, communication and noise effects. (3) Research to establish new pistol design parameters. (4) Study of physiological reactions in research on stress effects. (5) Evaluation of effectiveness of tracers in field experiments.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: To expand support efforts in human-factors research to include all Army materiel development, especially electronics and communications equipment. To develop a highly productive, mission-oriented group in basic human-factors research in order to eliminate current areas of ignorance regarding man's performance capabilities.

NAME AND LOCATION: U.S. Army Nuclear Defense Laboratory (tenant)  
Edgewood Arsenal, Maryland

COMMAND: U.S. Army Materiel Command

Commanding Officer: Lt. Colonel Harold E. Shaw

Acting Technical Director: Edwin H. Bouton

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5,350	5,592	5,650
Total in-house RDT&E *	2,118	1,523	1,655
Annual operating cost *	0.190	0.200	0.200
Total RDT&E program	3,623	3,860	3,900
Total procurement program	0	0	0
Total O&M program	0.162	0.162	0.162
Total other programs	1,658	1,670	1,675
Total annual lab. program	5,443	5,692	5,731

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	95	5	46	49
Civilian	105	7	63	42
Total	200	12	109	91

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0	53,374	87,044	0	140,418	2.0
					3.0

MISSION: Conduct research and field experiments in the nuclear-weapons-effects (NWE) area of initial radiation, residual radiation and fallout, shielding, and thermal-radiation phenomena. Provide technical information and assistance in the fields of radiological and nuclear defense and health physics. Provide environmental monitoring and other radiological safety support.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Has excellent reputation for reliability in NWE research and testing in decontamination, fallout, initial and thermal radiation and shielding. (2) In test-ban discussions, was named key DoD nuclear laboratory. Contributed in (3) neutron and gamma dosimetry and spectral measurement; (4) radioactive-particle characteristics; methods of waste disposal; (5) fallout prediction and evaluation of NWE data.

CURRENT IMPORTANT EFFORTS: (1) Emphasis on low-energy physics, with programs in solid state physics. (2) Radiation transport, cross-section measurement, neutron spectroscopy, radiation damage, superconductivity neutron scattering, and neutron-time-of-flight technology since test ban. (3) Participation in underground tests to study as many as possible of above areas. (4) Initiated radioactive-particle formation. (5) Shielding and waste-disposal programs.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Additional emphasis will be placed on low-energy physics research with the installation of a 15-Mev Tandem Van Graaff Accelerator. It is planned to add basic research programs to develop additional techniques for obtaining needed information of effects of nuclear weapons, as much essential data is extremely difficult to obtain under limitations imposed by the test ban.

NAME AND LOCATION: U. S. Army Chemical Laboratories  
 Edgewood Arsenal, Edgewood, Maryland  
 COMMAND: U.S. Army Munitions Command (MUCOM)  
 Commanding Officer: Colonel J.H. Batte\*\*  
 Technical Director: None (Mr. Carroll H. Staley, at MUCOM)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	35.861	36.820	39.427
Total in-house RDT&E *	26.608	27.463	28.993
Annual operating cost *	1.906	2.153	2.175
Total RDT&E program	42.688	43.800	44.200
Total procurement program	2.000	4.740	4.740
Total O&M program	1.035	1.150	1.160
Total other programs	2.483	2.634	3.221
Total annual lab. program	48.206	52.324	53.321

Note: \*Included in the totals. \*\*As of 19 September 1966,  
 Colonel William W. Stone, Jr., became Commanding Officer.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	331	15	183	148
Civilian	1,967	63	973	994
Total	2,298	78	1,156	1,142

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
2,700	543,777	133,598	/93,875/	771,250	NA*

Note: \*Acquired prior to 1918

MISSION: (U) R&D on chemical agents, munitions and CB protective materiel. Procurement, production, maintenance engineering and quality assurance as assigned. Program proposals, budgets and funding requirements for chemical items needed by services and for all chemical agents in DoD. Research with Army Medical Service on defensive aspects of chemical weapons, and evaluate technical aspects of program.

PAST SIGNIFICANT ACCOMPLISHMENTS: This information is CLASSIFIED.

CURRENT IMPORTANT EFFORTS: This information is CLASSIFIED.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

This information is CLASSIFIED.

NAME AND LOCATION: U. S. Army Biological Laboratories  
 Fort Detrick, Frederick, Maryland  
 COMMAND: U. S. Army Munitions Command  
 Commanding Officer: Colonel V. L. Ruwet\*  
 Technical Director: Dr. R. D. Houseman

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	22.978	23.000	23,600
Total in-house RDT&E*	18.427	18.647	19,100
Annual operating cost*	4.638	4.650	4,680
Total RDT&E program	25.878	25.950	26,000
Total procurement program	1.896	1.900	1,900
Total O&M program	0.936	0.940	0.940
Total other programs	1.187	0.910	0.910
Total annual lab. program	29.897	29.700	29,750

Notes: \*Included in the totals. \*\*As of 6 September 1966,  
 Colonel P.G. Olenchuk became Commanding Officer.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	225	23	79	146
Civilian	1,973	94	1,054	919***
Total	2,198	117	1,133	1,065

Note: \*\*\*Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
1,229	1,098,915	102,962	7850,672	2,052,549	66.0	17.0

MISSION: (U) R&D on biological agents, munitions and warning. Procurement, production, maintenance engineering and quality assurance as assigned. Program proposals, budget and funding requests for biological items required by services and for all biological agents in DoD. With Army Medical Service, develop program guidance on medical research for defense aspects of biological weapons, and evaluate technical aspects of program.

PAST SIGNIFICANT ACCOMPLISHMENTS: This information is CLASSIFIED.

CURRENT IMPORTANT EFFORTS: (U) (1) High-priority in-house effort directed toward warning program. (2) Increased across-the-board effort in tissue culture in order to grow new agents. (3) Increased emphasis on purification, stabilization and drying of agents. (4) New process techniques. (5) Physical protection techniques.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (U) Develop biological agents of military significance in accordance with requirements. Support engineering development of warning systems. Field/chamber comparisons of biological-agent aerosol characteristics.

NAME AND LOCATION: Natick Laboratories  
 Natick, Massachusetts  
 COMMAND: Headquarters, U.S. Army Materiel Command  
 Commanding Officer: Brig. General W. M. Mantz  
 Technical Director: Dr. Dale H. Sieking

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	20.055	20.250	20.450
Total in-house RDT&E *	11.833	12.082	12.360
Annual operating cost*	2.932	2.785	2.910
Total RDT&E program	16.868	17.300	17.600
Total procurement program	2.236	2,800	2,800
Total O&M program	7.289	7,300	7,300
Total other programs	0.698	0.675	0.675
Total annual lab. program	27.091	28,075	28.375

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	150	15	71	79
Civilian	1,580	84	417	1,163 **
Total	1,730	99	488	1,242

Note:\*\*Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
100	423,895	65,900	/58,641/	548,436	30.0	9.0

MISSION: Conduct research, engineering and development to provide the combat soldier with advanced equipment and supplies to cope with natural and man-made hazards. Although research-oriented, materiel requirements are met in areas of rations, clothing, air-delivery equipment, containers, field support equipment, tentage, and health and welfare items.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Body armor for helicopter crew, small-arms protection for legs and torso. (2) Modular airdrop platforms for C-130 and C-141 aircraft, maximum capacity 35,000 pounds. (3) Rot-resistant DMS (direct-molded sole) tropical boot and spike-resistant insole. (4) Food packet, subsistence long-range patrol and 6-man quick-serve meal. (5) Climatic atlas for Southeast Asia.

CURRENT IMPORTANT EFFORTS: Ration miniaturization and radiation preservation for troop feeding; FY 1967 procurement, irradiated, 30,000 pounds bacon, 400,000 pounds potatoes, 200,000 pounds flour. (2) Blast-protective boot and overboot, 1000 of each in procurement for Southeast Asia. (3) 35,000-pound airdrop system for M551 tank. (4) Undergarment air-cooled system for individual crewman, Mohawk and Cobra aircraft (cabin reaches 130° F), Southeast Asia. (Environmental studies in Thailand.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Maintain realistic alignment with military materiel needs so the combat soldier can cope with battlefield environment of the future. Increase RDT&E responsibility for clothing, food and shelter (tents) within DoD; expand environmental sciences, engineering psychology, human-factors engineering and chemical warfare protective missions.

NAME AND LOCATION: U.S. Army Aviation Materiel Laboratories (tenant)  
Fort Eustis, Virginia

COMMAND: U.S. Army Aviation Materiel Command  
Commanding Officer: Colonel J. L. Klingenhagen  
Technical Director: Mr. L. M. Hewin

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	5.112	5.030	5.447
Total in-house RDT&E *	4.565	4.636	5.070
Annual operating cost *	2.245	2.200	2.525
Total RDT&E program	25.718	26.150	26.500
Total procurement program	0	0	0
Total O&M program	0.017	0.020	0.020
Total other programs	0.529	0.374	0.357
Total annual lab. program	26.264	26.544	26.877

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	77	3	59	18
Civilian	362	2	163	199
Total	439	5	222	217

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
108	11,060	60,800	/188,400/	260,260	1.0	9.0

MISSION: Plans and executes a comprehensive program in research, exploratory development and advanced development, as well as assigned functions in engineering development, to support the Army aircraft R&D program.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Advanced V/STOL research aircraft (XV-4A, XV-5A, SC-142). (2) Advanced rotary-wing, high-speed aircraft (XH-51A, HU-1B compound) for cruise speed over 200 knots. (3) Prerequisite studies for AAFSS (advanced aerial fire-support system). (4) New concepts of aircraft safety and survival (lightweight armor, crashproof tanks, "fireproof" fuels). (5) Aerodynamic loads, propulsion and subsystems for new and improved aircraft systems.

CURRENT IMPORTANT EFFORTS: (1) Research in propulsion, performance, etc., of advanced V/STOL aircraft. (2) Advanced rotary-wing compound (composite) aircraft program for future Army systems. (3) Advanced design study and tradenoff analysis for new aircraft systems--UTTAS (utility tactical transport aircraft system), HLH (heavy-lift helicopter) and STAAS (surveillance and target-acquisition aircraft system). (4) Advanced development in propulsion systems, safe fuels, flexible-wing system, control system and components. (5) New aircraft-systems development in support of aircraft project managers.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Concept feasibility studies and program plans for new aircraft systems to meet DoD requirements. Advanced aircraft systems technology in performance, propulsion, stability and control, dynamics and related areas. In-house laboratory facilities to support Army aircraft research. Long-range R&D program in personnel, facilities and funding for future Army aircraft systems.

NAME AND LOCATION: U.S. Army Aeronautical Research Laboratory (tenant)  
Ames Research Center, Moffett Field, California

COMMAND: Headquarters, U.S. Army Materiel Command  
Commanding Officer: Colonel Cyril D. Stapleton  
Technical Director: Paul F. Yaggy

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.684	1.765	1.815
Total in-house RDT&E *	1.669	1.750	1.800
Annual operating cost*	1.363	1.365	1.370
Total RDT&E program	1.669	1.750	1.800
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.015	0.015	0.015
Total annual lab. program	1.684	1.765	1.815

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1	0	1	0
Civilian	37	0	15	22
Total	38	0	16	22

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
0	7x10 wind tunnel	1.468	16,273	7,741	1.0	0.670

MISSION: Implement and direct Army portion of joint Army/NASA (National Aeronautics and Space Administration) agreement for aeronautical research. Conduct in-house basic and applied aeronautical research by theory and experiment. Conceive, negotiate, and participate in joint research programs with NASA in NASA facilities. Provide consultation on aeronautical problems to all Army agencies.

PAST SIGNIFICANT ACCOMPLISHMENTS: (Laboratory was established in FY 1966.)  
(1) Refurbished 7x10-foot wind tunnel. (2) Began refurbishing wind-tunnel data and auxiliary systems. (3) Limited research testing on rotary-wing flow mechanics. (4) Initiated joint research programs with NASA (National Aeronautics and Space Administration) on rotary wings with jet flap propulsion, stopped rotors. (5) Started work on propulsion wing concept.

CURRENT IMPORTANT EFFORTS: (1) Refurbishing wind-tunnel data and auxiliary systems. (2) Research programs in basic flow mechanisms of rotary wings and V/STOL, planning and design phases. (3) Limited testing in wind tunnel on basic flow mechanics of rotary wings. (4) Wind-tunnel calibration under way. (5) Studies of wind-tunnel wall constraints on V/STOL testing.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Conduct basic and applied research in-house and jointly with NASA to provide data for evolution and development of new and improved aircraft that will increase effectiveness and reduce cost of Army air mobility. Serve as consultant to development groups in effecting new concepts of air mobility. Generally advance state of the art in subsonic aeronautics.

NAME AND LOCATION: U.S. Army Cold Regions Research and Engineering  
Laboratory, Hanover, New Hampshire

COMMAND: Headquarters, U.S. Army Materiel Command

Commanding Officer: Colonel D. A. Kellogg

Technical Director: Mr. W. K. Boyd

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	3.434	3.595	3.620
Total in-house RDT&E *	2.517	2.536	2.814
Annual operating cost *	1.283	1.275	1.425
Total RDT&E program	3.308	3.350	3.800
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.328	0.430	0.430
Total annual lab. program	3.636	3.780	4.230

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	53	2	49	4
Civilian	219	16	145	78
Total	272	18	194	82

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	34,400	381,000	17,000	432,400	3.0	5.0

MISSION: Conduct basic and applied research and make scientific and engineering investigations on earth sciences; snow, ice and frozen ground; and facilities, systems and operations in adverse environments. Conduct research in methods of using various energy forms and systems to obtain information about surface and subsurface features in all environments.

PAST SIGNIFICANT ACCOMPLISHMENTS: Develop complete capability for military units to occupy and operate on and in the Greenland Ice Cap. (2) Develop design criteria, construction techniques and operational methods for snow, ice and permafrost conditions. (3) Technique for control of deformation in undersnow camps. (4) Technique for determining bearing strength of ice sheets. (5) Technique for crevasse detection.

CURRENT IMPORTANT EFFORTS: (1) Basic research on physics and mechanics of natural materials in high mountain environment. (2) Methods of rapid excavation and transportation of frozen soil and rock. (3) Application of remote sensing techniques to military intelligence and combat engineering. (4) Airblast effects on snow. (5) Mechanics of ice.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Improve Army capability to occupy and operate in extreme earth environments by basic and applied research in earth sciences and related engineering technology, terrain analysis by remote sensors, fog abatement from artillery fire, movement over arctic terrain, and subsurface installations.

NAME AND LOCATION: U.S. Army Engineer Research and Development Laboratories  
Fort Belvoir, Virginia (tenant)

COMMAND: U.S. Army Mobility Equipment Command

Commanding Officer: Colonel Frank Milner

Technical Director (Acting): Mr. Oscar P. Cleaver

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	17.073	17.874	18.644
Total in-house RDT&E *	10.748	11.589	12.324
Annual operating cost*	3.768	4.214	4.789
Total RDT&E program	23.629	24.120	26.300
Total procurement program	4.044	4.150	4.200
Total O&M program	0.060	0.065	0.070
Total other programs	6.330	6.250	6.250
Total annual lab. program	34.063	34.585	36.820

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	27	6	19	8
Civilian	1090	10	571	519
Total	1117	16	590	527

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
1060	208,084	105,501	/214,353/	527,938	12.0	34.0

MISSION: RDT&E and production engineering on equipment: rail, marine and amphibious, construction, electric-power-generating; bridge and assault stream-crossing, fire-fighting, prefabricated building, waste disposal, heating and air-conditioning, camouflage and concealment, mine warfare, barrier and intrusion detection, demolitions, water purification, POL (petroleum, oil, lubricants), industrial engineering, land navigation and physical sciences.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Demonstrated feasibility of electrochemical oxidation of liquid hydrocarbon in fuel cells. Developed; (2) family of engine generator sets; (3) mobile assault bridge ferry; (4) all-weather/terrain-concealed intrusion-detection device; (5) submarine pipeline system for rapidly unloading fuel tankers.

CURRENT IMPORTANT EFFORTS: Developing: (1) Universal engineer tractor; (2) ultra-high-speed, high-frequency electric propulsion systems for terrestrial vehicle; (3) first fuel cell as silent forward-area power source (300-watt hydrazine-air); (4) lightweight fresh-water purification equipment set, 420 gph (gallons per hour); (5) sonic echoing methods of tunnel detection.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: To solve military problems relating to: earth-moving vehicles with common prime mover for constructing earthworks; POL distribution at ultra-high velocity, pipelining 600 gpm with special friction-reducing additives; make potable water from any contaminated source; hydrocarbon fuel cells; lightweight, remotely activated, rapid-emplacement obstacles; long-range detectors; devices to enable rapid passage of enemy mines and obstacles.

NAME AND LOCATION: U.S. Army Research Support Group (tenant)  
 Fort Belvoir, Virginia  
 COMMAND: U.S. A

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.518	2.818	2.198
Total in-house RDT&E*	1.800	1.100	0.600
Annual operating cost*	1.800	1.100	0.600
Total RDT&E program	1.800	1.100	0.600
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	1.718	1.718	1.598
Total annual lab. program	3.518	2.818	2.198

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military				
Civilian				
Total	0	0	0	0

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	0	0	0	0	0

MISSION: Provide administrative, logistical and technical support for Army environmental RDT&E activities, units, agencies and individuals. Command authority involving health, safety, national emergency or reallocation of support facilities and resources as necessitated by the vagaries of weather or other unpredictable contingencies.

PAST SIGNIFICANT ACCOMPLISHMENTS:

CURRENT IMPORTANT EFFORTS:

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
 Will be phased out during the fourth quarter of CY 1967.

NAME AND LOCATION: Ballistic Research Laboratories (tenant)  
Aberdeen Proving Ground, Maryland

COMMAND: Headquarters, U.S. Army Materiel Command  
Commanding Officer: Colonel Charles D.Y. Ostrom, Jr.  
Technical Director: Dr. Curtis W. Lampson

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	26,368	26,400	26,500
Total in-house RDT&E *	16,356	16,793	16,643
Annual operating cost *	2,688	2,641	2,696
Total RDT&E program	35,488	35,800	36,000
Total procurement program	0.088	0.095	0.095
Total O&M program	1,666	1,600	1,600
Total other programs	2,126	1,300	2,400
Total annual lab. program	39,368	39,795	40,095

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	64	8	59	5
Civilian	1,501	52	811	690 *
Total	1,565	60	870	695

Note: \* Includes G&A

SPACE AND PROPERTY

Space (square feet)			Cost (in \$ millions)		
Acres	Laboratory	Administrative	Building	Real property	Equipment
3,384	276,240	76,130	30,564	382,895	13.0
					39.0

MISSION: Applied research in interior, exterior and terminal ballistics and in target acquisition. Fundamental supporting research in relevant areas of mathematics, physics and chemistry, solid mechanics, fluid dynamics, chemical kinetics, molecular physics, combustion and detonation, radiation and propagation. Systems effectiveness analysis and research in relevant methodology; survey of munitions and studies of systems reliability.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) First electronic digital computer (ENIAC) in world used for scientific problems. (2) First supersonic tunnel and research program in U.S. used for projectile design. (3) Developed shaped-charge principles for weapons design and finned artillery projectiles. (4) Developed weapon-system evaluation technology for Army weapons.

CURRENT IMPORTANT EFFORTS: (1) Improve lethality, penetrability and flight characteristics of projectiles for Army weapons. (2) Target-vulnerability analysis and investigation of damage mechanisms for offensive and defensive purposes. (3) Comparative systems evaluation for Army materiel. (4) Reduce vulnerability of Army aircraft and tanks. (5) Exploratory development of liquid-propellant guns and guns for high-altitude and meteorological research.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Integration of basic-research results into coherent theoretical treatments of target detection, propulsion, flight and target-damage problems. Theoretical and experimental evaluation of new weapon concepts. Prediction of profitable lines for exploratory development. Comparative evaluation and optimization of Infantry assault, surface-to-surface, surface-to-air and air-to-surface weapons with integral fire control.

NAME AND LOCATION: Harry Diamond Laboratories  
Washington, D. C.

COMMAND: U.S. Army Materiel Command  
Commanding Officer: Lt. Colonel M.S. Hochmuth  
Technical Director: Mr. B. M. Horton

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	31.073	31.450	31.600
Total in-house RDT&E *	12.398	13.203	13.295
Annual operating cost *	4.400	4.675	4.740
Total RDT&E program	22.598	22.040	22.906
Total procurement program	14.809	14.850	14.850
Total O&M program	1.477	1.490	1.492
Total other programs	0.049	0.052	0.052
Total annual lab. program	38.933	39.032	39.300

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	6	4	6	0
Civilian	1,496	24	540	956
Total	1,502	28	546	956

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	239,335	54,644	0	293,979	4.0	16.0

MISSION: RDT&E on influence, time and command fuzing; target detection and signature analysis; target-intercept phase of terminal guidance; weapon-system synthesis and analysis for fuzing; counter-countermeasures, nuclear effects and severe mechanical environments; fluasics; instrumentation and simulation; components and materials. Industrial and maintenance engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Proximity fuzes for bombs, mortars, rockets, artillery, guided missiles, land mines; high-resolution radar, noise-modulated systems. (2) Rugged electronic components, printed circuits, photolithographic techniques, microminiaturization, teflon bonding. (3) Thermal battery. (4) Nuclear-weapons testing, effects, simulation and system evaluation, high-g instrumentation. (5) Fluasics.

CURRENT IMPORTANT EFFORTS: (1) Improved, lower cost, more reliable fuzes (including command and reentry) for artillery, mortars, rockets, guided missiles and land mines. (2) Target acquisition and terminal guidance. (3) Counter-countermeasures, nuclear effects, artillery environments. (4) Safing-and-arming and fluid-control systems. (5) Energy-transformation components, materials, techniques, instrumentation and simulation.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Fuzing, target detection, signature analysis and terminal guidance. Weapon-system synthesis and analysis, including fuze-warhead-guidance tradeoffs, immunity to adverse influences. Military applications of fluid-control systems. Selected energy-transformation and -control systems. Carry out RDT&E tasks as assigned.

NAME AND LOCATION: Picatinny Arsenal  
Dover, New Jersey  
COMMAND: U.S. Army Munitions Command  
Commanding Officer: Colonel J. Chambers  
Technical Director (Acting): Mr. A. Dorfman

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	59,618	57,100	59,763
Total in-house RDT&E *	31,250	32,497	35,160
Annual operating cost *	5,471	5,580	5,690
Total RDT&E program	74,750	75,000	76,950
Total procurement program	2,203	2,450	2,600
Total O&M program	0,411	0,425	0,430
Total other programs	2,804	0,850	2,850
Total annual lab. program	80,168	80,725	82,830

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	24	8	9	15
Civilian	3,416	29	1,283	2,133*
Total	3,440	37	1,292	2,148

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
5,884	632,079	487,283	72,604,409	3,723,771	64.0	35.0

MISSION: Operates commodity center for all nuclear and non-nuclear munitions (except chemical, biological and small-caliber); pilot plant for making prototypes; explosive ordnance center; DOD plastics technical evaluation center. Research and engineering for design, development, production, maintenance and technical support of mission items. Procures all Army nuclear munitions.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) First nuclear projectile (280mm) and all stockpiled Army nuclear munitions. (1) Put field of military pyrotechnics on scientific base; developed first infrared countermeasure for missiles. (3) Type-classified non-nuclear 118 (Std A), 18 and 19 (liquid-propellant), nuclear 52 (Std A). (4) Developed all cofram ammunition; R&D on nitrocellulose-based rocket propellant with advanced properties. (5) Proved feasibility of rocket-assisted projectile.

CURRENT IMPORTANT EFFORTS: (1) Develop ammunition for Southeast Asia (mine-dispersing submarine system, tunnel-destruction and Beehive projectiles). (2) R&D on advanced Army nuclear munitions for missiles, guns and demolition, including NIKE and PERSHING warhead sections. (3) Development of cofram ammunition. (4) Exploratory development of aimed warheads for missiles. (5) R&D on consumable cartridge cases and erosion-reducing additives.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue to provide fast response in development and engineering to support needs of forces in the field. Execute assigned missions with forward-looking efforts toward new principles, concepts, componentry and weaponry, including advanced lethal and propulsive materials, mechanisms and payloads, as well as initiating and control devices for them.

NAME AND LOCATION: Frankford Arsenal  
 Philadelphia, Pennsylvania  
 COMMAND: U.S. Army Munitions Command (MUCOM)  
 Commanding Officer: Colonel Paul Nilsson  
 Technical Director: None (Mr. Carroll H. Stalev, at MUCOM)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	14,533	15,150	16,300
Total in-house RDT&E *	12,223	12,698	14,028
Annual operating cost*	3,839	3,858	3,900
Total RDT&E program	16,881	17,350	19,500
Total procurement program	0.273	0.273	0.273
Total U&M program	0.128	0.128	0.128
Total other programs	0.843	0.794	0.794
Total annual lab. program	18.125	18,545	20,695

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	23	2	2	21
Civilian	1335	23	527	808 *
Total	1358	25	529	829

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
21	194,100	53,300	7285,600	533,000	6.0	9.0

MISSION: Operates commodity center for small-caliber munitions and PAD (propellant-activated devices). Specialization in optical materiel; metallurgy of non-ferrous and reactive metals; materials degradation; corrosion and its prevention; mycological deterioration and electrochemical coatings; power-transmission fluids for small control mechanisms; miniaturized ammunition. Also, artillery-shell metal parts, cartridge cases, mechanical timing devices, fire-control systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Demonstrated feasibility of small-arms caseless ammunition. Developed: (2) digital computers for artillery and battery control centers and adapted them to automotive-vehicle checkout; (3) weldable heat-treated aluminum armor alloy; (4) 40mm shotshell for use in Vietnam, and manufactured it. (5) Man-portable laser rangefinder for artillery forward observer, using state-of-the-art technology.

CURRENT IMPORTANT EFFORTS: (1) Caseless ammunition for small-caliber weapon systems. (2) Stabilized fire-control system with automatic tracking and laser rangefinder for combat vehicles, aerial weapons and conventional antiaircraft systems. (3) Cartridges for 20mm VRFWS (vehicle rapid-fire weapon system) and VADS (vehicle air defense system). (4) High-energy density gun propellants; gas generation for small arms. (5) Countermeasures to laser devices.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Life cycle of small-caliber ammunition, fire control (infantry, artillery, combat vehicles, aerial platforms) and PAD (propellant-activated devices). New and improved ammunition, mechanical timing and arm-safe devices for artillery, mortars, rockets, guided missiles, bombs, mines, demolition munitions. Shotshell, new propellants, pyrotechnics, laser countermeasures, etc.

NAME AND LOCATION: Rock Island Arsenal  
Rock Island, Illinois

COMMAND: U.S. Army Weapons Command  
Commanding Officer: Colonel H. A. Snyder  
Technical Director: Mr. E. T. Horn

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.710	4.100	4.300
Total in-house RDT&E *	3.219	3.939	4.125
Annual operating cost *	0.474	0.716	0.898
Total RDT&E program	3.714	4.655	5.023
Total procurement program	0.405	0.410	0.410
Total O&M program	0.760	0.760	0.760
Total other programs	0.096	0.114	0.114
Total annual lab. program	4.975	5.939	6.307

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	5	1	1	4
Civilian	458	2	129	329 *
Total	463	3	130	333

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
946	193,940	81,745	/38,667/	314,352	0.858

MISSION: Artillery mounts, recoil mechanisms, equilibrators, carriages, loaders and limbers, combat vehicles, turret components such as gun mounts, recoil mechanisms, elevating and traversing mechanisms, power controls, stability system (essentially all turret components except cannon, fire-control and communications equipment); secondary armament for combat and tactical vehicles, individual weapons; magazines; grenade launchers; aircraft armament subsystem (gun); spotting weapons; mounts and pads for mission weapons; clips and links; linkers and delinkers; loaders, hand carts, arm racks, target materiel training devices (except aerial drones); and associated equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed age-resistant rubbers. (2) Developed dry-film lubricants. (3) Analysis of carriage and launcher dynamics. (4) Designed, improved and increased life of recoil mechanisms for towed artillery and combat vehicles. (5) Developed auxiliary propelled 105mm and 155mm howitzer carriages.

CURRENT IMPORTANT EFFORTS: (1) Development of vehicle track pads with improved wear resistance. (2) Synthesis and development of low-temperature, oil-resistant elastomers. (3) Development of mathematical model for high-rate-of-fire weapon. (4) Concept and development of fire-out-of-battery weapon. (5) Concept and development of the cylindrical rotary viscous dampener.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Develop weapon lubricants and test procedures; evaluate and develop rubber materials and items; study corrosion and corrosion-prevention systems. Develop necessary capability to become a sophisticated buyer of assigned mission weaponry by performing in-house design, prototype manufacture, reliability testing and product engineering of weapons and weapon components.

NAME AND LOCATION: Springfield Armory  
Springfield, Massachusetts

COMMAND: U.S. Army Weapons Command  
Commanding Officer: Colonel A. H. Sweeney, Jr.  
Technical Director: Mr. H. F. Hawthorne

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	7.889	5.650	5.250
Total in-house RDT&E *	2.619	2.565	2.440
Annual operating cost*	1.455	1.599	1.599
Total RDT&E program	6.708	6.200	6.000
Total procurement program	3.172	2.000	2.000
Total O&M program	1.076	0.970	0.970
Total other programs	0.396	0.396	0.350
Total annual lab. program	11.352	9.566	9.320

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	2	0	0	2
Civilian	560	3	240	320 *
Total	562	3	240	322

Note: \*Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)				Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total	building	Real property	Equipment
334	25,800	7,000	/137,300/	170,100		2.0	5.0

MISSION: Responsible for research, design and development of individual weapons, machine guns, grenade launchers, secondary armament for combat and tactical vehicles, aircraft armament subsystems (gun-type), spotting weapons, mounts and pods for mission weapons, links, linkers, delinkers.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Improved recoil devices for automatic aircraft weapon system. (2) Determined dynamic properties of ordnance materials. (3) Developed stress-measurement techniques. (4) Developed vehicular gun-mount simulator. (5) Developed electro-polishing and chromium-plating processes for gun-barrel bores.

CURRENT IMPORTANT EFFORTS: (1) Development of improved barrels for automatic weapons. (2) Investigation of composite barrel construction for small-caliber barrels. (3) High-rate loading studies. (4) Increased emphasis on aircraft weaponization. (5) Development of new small-caliber weapon-system concepts.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Laboratory will be phased out September 1967.

NAME AND LOCATION: Watervliet Arsenal  
 Watervliet, New York  
 COMMAND: U.S. Army Weapons Command  
 Commanding Officer: Colonel F. Kornet, Jr.  
 Technical Director: Dr. R. E. Weigle

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	8.560	8.500	8.700
Total in-house RDT&E *	3.156	3.094	3.263
Annual operating cost *	1.222	1.227	1.305
Total RDT&E program	6.114	6.140	6.200
Total procurement program	3.800	3.800	3.800
Total O&M program	0.409	0.420	0.420
Total other programs	0.024	0.024	0.024
Total annual lab. program	10.347	10.384	10.444

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	3	0	0	3
Civilian	939	16	116	823 *
Total	942	16	116	826

Note: \* Includes G&A.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
3	149,900	17,913	0	167,813	1.0	1.0

MISSION: Planning, technical direction, accomplishment, evaluation of basic and applied research. Operational control of Dickson Gun Plant, Lima Ordnance Steel Foundry and Ridgewood Ordnance Plant for industrial mobilization. Research, design and development; production and production engineering; maintenance engineering; procurement and production, industrial mobilization planning, quality analysis and standardization for mortars, recoilless rifles, cannon assembly and components, training devices and associated equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Designed most artillery, tank cannon and mortars now in Army inventory. (2) Developed prototype dual-purpose mortar-- recoilless 60mm weapon. (3) Designed postoperative destruct system for Atomic Energy Commission. (4) Explained basic stress and force transfer mechanisms in composite materials. (5) Developed electro-deposition method of obtaining dispersion-strengthened materials, and achieved boron whiskers in laboratory.

CURRENT IMPORTANT EFFORTS: (1) Developing 81mm and 107mm mortar systems, U.S./FRG (Federal Republic of Germany) 152mm main battle tank, 105mm lightweight howitzer, for Marine Corps. (2) Establishing fatigue life condemnation criteria for all large-caliber weapons. (3) Applying composite materials in weaponry. (4) Basic analysis of fracture mechanism and fatigue behavior of thick wall tubes. (5) Fundamental study of high-pressure, ductile, brittle transitions in metals.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Develop surface physics, chemistry and applied mechanics center for analysis of friction, wear and fatigue problems. Study and evaluate composite materials and processes for weapons application through understanding of basic mechanisms. Couple applied research to weapon-concept programs for analysis of limited and guerrilla-type warfare. Design and develop weapons required by the Army.

NAME AND LOCATION: Army Tank-Automotive Command (ATAC) Laboratories  
 Warren, Michigan 48090

COMMAND: U.S. Army Tank-Automotive Command  
 Commanding General: Maj. General W.W. Lapsley  
 Technical Director: J.B. Hayes, Deputy Director, R&E Directorate

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	21,346	22,706	24,387
Total in-house RDT&E *	14,516	15,155	17,766
Annual operating cost *	4,267	4,675	4,936
Total RDT&E program	32,602	32,800	39,100
Total procurement program	9,533	10,380	10,950
Total O&M program	5,440	5,500	5,550
Total other programs	0,398	0,071	0,071
Total annual lab. program	47,973	48,751	55,671

Note: \*Included in the totals.

#### PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	5	1	1	4
Civilian	1,692	2	640	1,052*
Total	1,697	3	641	1,056

Note: \*Includes G&A.

#### SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
80	174,698	72,379	/151,288/	398,365	17.0	5.0

MISSION: Plans, directs or executes and appraises: (1) Research and applied research programs in physical science, nucleonics, land locomotion, automotive electronics, materials, applications and extreme environmental controls. (2) Human vehicular engineering studies. (3) Power combustion investigation and propulsion developments. (4) Vehicle suspension (track and wheel systems). (5) Test services (field and laboratory).

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Concept, design and fabrication of test rigs and kits for Southeast Asia. (2) Computer studies of vehicular vibration on humans. (3) Power propulsion developments. (4) Concept approach of track design (8,000 to 10,000 miles). (5) Hyperbolic viewing system. (6) Power increase in VHO (very-high-output) and VCR (variable-compression-ratio) engines, 75 to 100 percent.

CURRENT IMPORTANT EFFORTS: (1) Concept program for MICV-70 vehicles. (2) Vehicle water-performance studies. (3) Laboratory dynamic simulator for suspension systems. (4) Development of automotive military turbine at 1500-horsepower level. (5) Study of multivoltage systems. (6) Vehicle-obstacle relationships.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Parametric studies to better define military requirements and desired vehicle capabilities. (2) Power-plant development and combustion research. (3) Advanced suspension studies. (4) Ancillary and auxiliary equipment development, i.e., diagnostic equipment, turbine air cleaners, fire-extinguishing systems. (5) Armor and crew-protection systems (ballistic and land mines), both trucks and combat vehicles. (6) CBR (chemical, biological, radiological) systems applications. (7) Night-vision applications.

NAME AND LOCATION: U.S. Army Limited War Laboratory (tenant)  
Aberdeen Proving Ground, Maryland

COMMAND: Office of the Chief of Research and Development  
Commanding Officer:  
Technical Director:

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.427	3.100	3.200
Total in-house RDT&E *	2.427	3.100	3.200
Annual operating cost*	1.430	2,113	2,163
Total RDT&E program	12.577	7.000	7.500
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs**	0.251	0.328	0.050
Total annual lab. program	12.828	7.328	7.550

Notes: \*Included in the totals.

\*\*FY 1967 "Other" includes 0.245 MCA.

PERSONNEL DATA --END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	12	0	12	0
Civilian	133	2	58	75
Total	145	2	70	75

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
80	29,000	5,100	713,000	47,100	0.428	0.590

MISSION: To provide a centralized R&D activity with a quick-reaction capability for meeting Army operational requirements relating to limited war, particularly to war of low intensity in underdeveloped or remote areas of the world. To generate new ideas for materiel items to improve the effectiveness of military personnel committed to limited-warfare actions.

PAST SIGNIFICANT ACCOMPLISHMENTS: Development of: (1) high-frequency radio for jungle use; (2) scout-vehicle armor kit; (3) personnel cargo-lowering system for helicopters; (4) smoke-screen troop landing; (5) device to rapidly refuel helicopters from 55-gallon drums.

CURRENT IMPORTANT EFFORTS: Accelerated development of 21 PROVOST program items, including: (1) personnel detector, chemical; (2) integral smoke generator, airborne; (3) flame projector, hand-held; (4) jungle canopy platform; (5) anti-personnel caltrops.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: A major field, judged in terms of both man effort and dollars, is in ambush prevention, detection and neutralization, with the predominant effort in ambush detection by chemical means. A major objective is attention to other geographical areas of the world where political instability could evolve into activities similar to those in South Vietnam.

**DEPARTMENT OF THE NAVY**

NAME AND LOCATION: Naval Air Development Center  
 Johnsville, Warminster, Pennsylvania  
 COMMAND: Chief of Naval Material  
 Commanding Officer: Captain B. L. Towle  
 Chief Scientist: Dr. H. Krutter

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	52.481	55.165	58.618
Total in-house RDT&E *	28.500	30.247	31.806
Annual operating cost *	5.721	5.800	5.800
Total RDT&E program	45.626	48.500	50.000
Total procurement program	3.732	3.800	4.000
Total O&M program	0.498	0.500	0.500
Total other programs	2.625	2.365	4.118
Total annual lab. program	52.481	55.165	58.618

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	470	1	35	474
Civilian	1,826	14	715	1,095
Total	2,296	15	750	1,569

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
749.9	761,990	55,671	454,818	1,272,479	21.1

MISSION: Conduct research, design, development, test and evaluation of aeronautical systems and components. Perform research and development in aviation medicine.

PAST SIGNIFICANT ACCOMPLISHMENTS:

- (1) Advanced ASW (antisubmarine-warfare) avionics (A-New).
- (2) Weapons-handling equipment.
- (3) PHOENIX fire control.
- (4) ASW radar.

CURRENT IMPORTANT EFFORTS: (1) Airborne ASW integrated data-processing systems. P-3C aircraft (A-new). (2) Air ASW sensors, acoustic and nonacoustic. (3) Airborne early warning--integrated avionics development for 1970-era new aircraft. (4) PHOENIX, air-to-air missile system for F-111B aircraft. (5) ILAAS-1 (integrated light attack avionics system).

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

Plan to emphasize a strong responsibility for broad improvement in the major warfare areas of air ASW, airborne anti-air warfare and associated airborne systems. Increased emphasis in fundamental research and independent exploratory-development programs in the basic technologies required for components, projects and programs in support of major functional areas.

NAME AND LOCATION: Naval Air Engineering Center  
Philadelphia, Pennsylvania

COMMAND: Chief of Naval Material  
Commanding Officer: Captain A. H. Clancy  
Chief Scientist: Dr. F. O. Ringleb

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	85.488	90.00	92.00
Total in-house RDT&E*	17.764	18.986	20,017
Annual operating cost*	8.641	8.70	8.70
Total RDT&E program	30,012	31.00	32.00
Total procurement program	87.445	90.00	85.00
Total O&M program	7.088	7.00	7.50
Total other programs	11.941	12.00	12.00
Total annual lab. program	136.486	140.00	136.50

Note: \*Included in the totals.

\*NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	158	1	166	0
Civilian	3,074	8	580	2,496
Total	3,232	9	746	2,496

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
560	1,510,075	212,296	1522,277	2,244,648	33.9	34.4

MISSION: Conduct research, design, development, test and evaluation of aeronautical accessories, power plants, air-crew safety devices, equipment, structures and materials. Conduct research, engineering, design, prototyping, development, limited production and maintenance of launching and recovery devices.

PAST SIGNIFICANT ACCOMPLISHMENTS:

- (1) SATS (short airfield for tactical support).
- (2) Shipboard catapults and arresting gear.
- (3) Visual landing aids.
- (4) Materials research.
- (5) Physiological protection devices (aircrews).

CURRENT IMPORTANT EFFORTS: (1) SATS--lightweight matting development.  
(2) Shore-based emergency arresting gear--higher capacity, quick-retract capability. (3) Materials research--evaluate all new structural alloys for Navy use regarding corrosion, fatigue and welding characteristics. (4) Fatigue life prediction program for aircraft. (5) Improved aircrew escape, survival and recovery systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

Continued emphasis on improving the capability and design of SATS and of shipboard catapult and arresting gear. Applied research toward formulating new materials required by new flight operating environments of aircraft and aerospace vehicles. Improved design criteria for aircraft structures. R&D on protective and safety equipment used for aircrew escape, survival and recovery.

NAME AND LOCATION: Naval Ordnance Laboratory  
 Corona, California  
 COMMAND: Chief of Naval Material  
 Commanding Officer: Captain E. B. Jarman  
 Technical Director: Dr. F. S. Atchison

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	21.380	27.170	27.570
Total in-house RDT&E*	9.964	12.649	13.732
Annual operating cost*	3.765	3.800	3.800
Total RDT&E program	16.061	21.000	22.000
Total procurement program	0.054	0.050	0.050
Total O&M program	0.018	0.020	0.020
Total other programs	5.247	6.100	5.500
Total annual lab. program	21.380	27.170	27.570

Note: \*Included in the totals.

/ NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	5	0	4	1
Civilian	864	22	361	505
Total	869	22	365	506

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
660.5	328,729	56,571	/115,400/	500,700	7.6 11.5

MISSION: Conduct research, analysis, feasibility studies, development, design, engineering, testing, evaluation, inspection and surveillance relating to materials, assemblies and systems, principally in the field of guided missiles, guided-missile fuzes and related electronic devices.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Development of fuzes for all Navy tactical guided missiles. (2) Development of techniques for optical guidance of missiles. (3) Development of techniques for radiation homing of missiles. (4) Protection of systems from electronic countermeasures. (5) Concepts of new air-launched weapons.

CURRENT IMPORTANT EFFORTS: (1) Development of the interim ARM (antiradiation missile) weapons system. (2) Missile fuzes for threats of the 1970s. (3) Navy missile telemetry for use in the 1970s. (4) Development of new warheads and warhead-initiation techniques. (5) Fuzing and warheads for antisatellite weapons; coordination of the Navy's antisatellite program.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Development of advanced radiation homing weapons. (2) Missile fuze research and development. (3) Air-launched weapons, including optically guided systems for night operations. (4) Missile-effectiveness analyses. (5) Telemetry development.

NAME AND LOCATION: Naval Ordnance Laboratory  
 White Oak, Maryland  
 COMMAND: Chief of Naval Material  
 Commanding Officer: Captain Ernest F. Schrieter  
 Technical Director: Dr. Gregory Hartmann

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	65,739	79,530	87,470
Total in-house RDT&E *	38,786	40,808	41,198
Annual operating cost *	7,053	7,493	7,689
Total RDT&E program	59,757	69,698	80,946
Total procurement program	3,487	1,919	1,629
Total O&M program	0,268	0,522	0,522
Total other programs	3,459	7,391	4,373
Total annual lab. program	66,971	79,530	87,470

Note: \*Included in the totals.

/ NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	80	0	24	68
Civilian	3,174	85	1007	2,135
Total	3,254	85	1031	2,203

SPACE AND PROPERTY

Space (square feet)				Cost (in \$ millions)		
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
1,170	709,496	159,300	1471,880	1,340,676	41.0	20.2

MISSION: Conduct research, design, development, test and evaluation of complete ordnance systems, assemblies, components and materials pertaining to existing, advanced and proposed weapons, principally in the fields of missiles and underwater ordnance. Conduct research in the ordnance sciences.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) SUBROC. (2) PUFFS fire-control system. (3) POLARIS arming and fuzing. (4) IR (infrared) projectile fuzes. (5) Family of high-temperature-resistant explosives.

CURRENT IMPORTANT EFFORTS: (1) CAPTOR. (2) Mk 17 reentry body arming and fuzing. (2) Kinetic-energy weapons. (4) Secure emergency communications transmitter (SECT) for POLARIS submarines. (5) Advanced submarine fire-control systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Expertise in weapons systems for Navy and DoD. (2) Originate new weapon systems/optimum FR/IED (fundamental research/independent exploratory development) programs. (3) Lead advanced concepts in sea-based deterrents. (4) R&D in aeroballistics and explosive materials. (5) Weapon systems for ASW, STRIKE and strategic warfare.

NAME AND LOCATION: Naval Ordnance Test Station  
China Lake, California

COMMAND: Chief of Naval Material  
Commanding Officer: Captain J. I. Hardy, USN  
Technical Director: Dr. William B. McLean

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	135.500	141.528	150.821
Total in-house RDT&E *	67.500	70.107	73.700
Annual operating cost *	20.752	21.000	21.000
Total RDT&E program	100.750	107.599	126.619
Total procurement program	17.950	16.529	7.702
Total O&M program	1.700	1.500	1.500
Total other programs	15.100	16.000	15.000
Total annual lab. program	135.500	141.628	150.821

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1,093	0	32	1,089
Civilian	4,852	76	1,226	3,564
Total	5,945	76	1,258	4,653

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
1,125,266 / 853,994	289,499	6,631,165	7,774,658	243,300	74.2

MISSION: To conduct research, design, development, limited production, tests and technical evaluation of complete weapon systems, their components and assemblies, principally in the fields of rockets, guided missiles, underwater weapons and aircraft fire control.

PAST SIGNIFICANT ACCOMPLISHMENTS: Conception through development and Fleet introduction of: (1) three models of SIDEWINDER guided missile; (2) ASROC ASW weapon; (3) undersea vehicles such as MORAY, DEEP JEEP and CURV; (4) SHRIKE antiradiation missile; (5) retrofix and follow-on improvement of freefall weapons such as SNAKEYE retarded bomb for use in Vietnam.

CURRENT IMPORTANT EFFORTS: Conception and development of: (1) air-to-surface guided weapons such as WALLEYE, CONDOR, SNIPE; (2) ASW weapons such as MK 46 Mod 1 torpedo; (3) advanced freefall weapons such as ROCKEYE II antitank weapon and BIGEYE chemical weapon; (4) weapon-system integration for rocket-propelled 5-inch projectiles--BOMROC and RAP; (5) exploration of advanced techniques for search, recovery, rescue and salvage in the deep sea.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Development of: (1) advanced air-launched and ASW weapon systems; (2) quick-response surface-launched weapon systems; (3) materials, structures and vehicles for exploration and habitation of all ocean depths; (4) research and engineering development in high-risk, large-payoff concepts such as FAX explosives and other new warhead mechanisms; (5) development and operation of land and sea ranges as advanced data-gathering systems.

NAME AND LOCATION: U.S. Naval Underwater Weapons Research and Engineering  
Station, Newport, Rhode Island

COMMAND: Chief of Naval Material  
Commanding Officer: Captain Ward W. Witter  
Technical Director: G. G. Gould

PROGRAM DATA BY FISCAL YEAR (in \$ millions) +

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	43.296	42.890	42.458
Total in-house RDT&E *	10.867	13.545	13.937
Annual operating cost *	2.600	2.624	2.644
Total RDT&E program	28.404	26.131	27.000
Total procurement program	9.899	10.000	10.000
Total O&M program	4.618	5.000	5.000
Total other programs	1.576	1.286	2.284
Total annual lab. program	44.497	42.417	44.284

Note: \*Included in the totals.

+NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	100	0	5	105
Civilian	1,420	5	530	772
Total	1,520	5	535	877

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Cost (in \$ millions)		
				Total building	Real property	Equipment
801.2	267.676	118.652	/662,453/	1,048,781	14.80	5.20

MISSION: To conduct research, development, test and evaluation of underwater weapon systems, assemblies, components and materials. Receive, recondition, store and issue torpedoes, fire-control subassemblies and related materials.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) AUTEC (Atlantic Undersea Test Evaluation Center) concept and development, plus tracking instrumentation. (2) Propulsion system for Mk 48 torpedo. (3) Mobile acoustic torpedo targets and ASW Fleet target. (4) Improvement of Torpedo Mk 37 Mod 1 and development of Mk 37 Mod 2. (5) Development and evaluation of DASH (drone antisubmarine helicopter).

CURRENT IMPORTANT EFFORTS: (1) Mk 48 torpedo--evaluation, design cognizance and in-service engineering. (2) AUTEC expansion and development of Atlantic and Pacific Tactical Ranges. (3) Provide anti-surface-ship torpedo (SLAST). (4) Weapons systems accuracy trials (WSAT) and fleet readiness. (5) New fire-control developments (PAIR, SISS, etc.)

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Telemetry to negate torpedo countermeasures. (2) Demonstrate shallow-water homing capabilities of torpedoes. (3) Submarine launchers for wire-guided torpedoes. (4) Advanced fire-control hardware and software. (5) Wire-powered torpedoes and deep, mobile, tethered sonars.

NAME AND LOCATION: U. S. Naval Weapons Laboratory  
 Dahlgren, Virginia  
 COMMAND: Chief of Naval Material  
 Commanding Officer: Captain W. A. Hasler, Jr., USN  
 Technical Director: Bernard Smith

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	28.311	33.900	36.707
Total in-house RDT&E *	11.546	21.018	22.758
Annual operating cost *	8.848	10.509	11.380
Total RDT&E program	19.463	23.391	25.327
Total procurement program	2.662	3.200	3.460
Total O&M program	0.601	0.724	0.781
Total other programs	5.585	6.700	7.230
Total annual lab. program	28.311	34.015	36.798

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	121	0	20	125
Civilian	1,894	15	520	1,398
Total	2,015	15	540	1,523

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
4,500	609,332	7,447	/379,869/	996,648	28.80	23.80

MISSION: Conduct research, development, design, and technical evaluation of programs dealing with weapons, ballistics, ordnance and astronautics; and serve as prime agency of the Bureau of Naval Weapons (BuWeps) in the field of computation and data processing.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) POLARIS--geoballistic theory and all FBM (Fleet ballistic missile) guidance data. (2) Satellite geodesy, precise location of worldwide sites. (3) Resolved EM (electromagnetic) compatibility of Navy surface missile systems. (4) Feasibility of capsular escape system for helicopters. (5) Amphibious operations--simulation models.

CURRENT IMPORTANT EFFORTS: (1) ASW analysis--simulation models of full-scale ASW engagements. (2) Electromagnetic environmental collection system. (3) PHOENIX warhead. (4) ADWAR (advanced directional warhead). (5) Helicopter armament program--equipment for counterinsurgency aircraft.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) POSEIDON ballistic system. (2) Electronic warfare--achieve EM compatibility at sea. (3) Digital fire-control systems, including computer software. (4) Conical shock tube--equipment response to nuclear blast. (5) Ordnance systems analyses.

NAME AND LOCATION: Naval Aerospace Recovery Facility  
El Centro, California

COMMAND: Naval Air Systems Command  
Commanding Officer: Commander W. H. Koenig  
Technical Director: Mr. Howard Fish

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.853	1.200	1.416
Total in-house RDT&E*	0.787	1.106	1.305
Annual operating cost*	0.161	0.185	0.218
Total RDT&E program	1.275	1.544	1.822
Total procurement program	0.598	0.464	0.700
Total O&M program	0.066	0.094	0.110
Total other programs	2.910	0.983	0.927
Total annual lab. program	4.849	3.085	3.559

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	237	0	0	0
Civilian	52	0	13	29
Total	289	0	13	29

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	16,270	4,766	789,060	110,096	0	

MISSION: To conduct development, test, and evaluation of parachutes and related assemblies; human-escape methods and systems; retardation and recovery systems and rescue, survival and personnel safety equipment; stabilization, retardation and recovery systems for lay-down-type weapons, aircraft, missile and capsule assemblies; special logistic aerial-delivery methods, techniques and equipment.

- PAST SIGNIFICANT ACCOMPLISHMENTS: (1) MERCURY recovery system.  
(2) GEMINI/APOLLO recovery systems.  
(3) SKYSAIL parachute for use in high-speed aircraft escape systems.  
(4) Photo coverage, film production, textile laboratory and machine-shop support for NASA Project REEF recovery-system evaluation.  
(5) Development of parachute-deflating pockets to prevent drag after landing.

CURRENT IMPORTANT EFFORTS: (1) Helicopter fuselage capsule escape system--development of ballistic parachute recovery subsystem. (2) Automatic free-style back-type parachute with adjustable harness. (3) Zero/zero modular escape system. (4) Development of parachute recovery system for runway cratering device.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

- (1) Helicopter capsular escape system--application to two operational Fleet helicopters. (2) Search/rescue visual locator beacon. (3) Dynamic decelerators other than parachutes. (4) Investigation of new-type fabrics for parachutes.

NAME AND LOCATION: Naval Air Mine Defense Development Unit  
Panama City, Florida

COMMAND: Naval Air Systems Command  
Officer in Charge: Commander O. R. Toon  
Director: (No civilians)

PROGRAM DATA BY FISCAL YEAR (in \$ millions),

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.939	0.814	1.157
Total in-house RDT&E *	0.787	0.797	1.140
Annual operating cost*	0.016	0.017	0.0017
Total RDT&E program	0.787	0.797	1.140
Total procurement program	0	0	0
Total O&M program	0.016	0.017	0.017
Total other programs	0.136	0	0
Total annual lab. program	0.939	0.814	1.157

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	35 (5 officers)	0	0	35
Civilian	0	0	0	0
Total	35	0	0	35

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
6.2	0	1,650	/21,579/	23,229	199.0	156.0

MISSION: To assist in the development and evaluation of equipment, systems and techniques for the countering of sea mines by aircraft.

PAST SIGNIFICANT ACCOMPLISHMENTS:

- (1) Mk 101, Mod 1--mechanical minesweeping gear.
- (2) Mk 104, Mod 1--venturi device for influence minesweeping.
- (3) Mk 16, Mod 1, and Mk 17, Mod 1--cutter to sever mine moorings.
- (4) RH-3A helicopter--mine-countermeasures helicopter.

CURRENT IMPORTANT EFFORTS:

- (1) Mk 105, Mod 1, PAGE.
- (2) AN/ALQ-79 TURTLE.
- (3) EX-19 cutter.
- (4) Mk 103, Mod 0, mechanical minesweeping gear.
- (5) AN/AQS-8 sonar.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

- (1) Moored/acoustic MCM (mine-countermeasures) gear.
- (2) Airborne magnetic MCM gear.
- (3) Airborne shadowgraph.
- (4) RH-53 helicopter.
- (5) Airborne MCM navigation.

NAME AND LOCATION: Naval Air Test Center  
 Patuxent River, Maryland  
 COMMAND: Naval Air Systems Command  
 Commanding Officer: Rear Admiral D. S. Smith  
 Technical Director: Mr. John B. Paradis

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	26,446	28,900	41,521
Total in-house RDT&E *	18,745	20,800	28,932
Annual operating cost*	9,680	10,500	11,900
Total RDT&E program	21,797	22,700	33,826
Total procurement program	1,292	1,984	1,525
Total O&M program	3,330	3,716	4,980
Total other programs	19,985	21,176	29,568
Total annual lab. program	46,404	49,576	69,899

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	2,817	0	130	2,687
Civilian	1,803	2	216	1,585
Total	4,620	2	346	4,272

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Total building	Cost (in \$ millions)	
					Real property	Equipment
7,997	870,000	151,000	73,006,852	4,027,852	112.80	17.40

MISSION: To conduct tests and evaluation of aircraft weapon systems and their components.

PAST SIGNIFICANT ACCOMPLISHMENTS: Every new Navy aircraft has been tested here. Other projects have been:

- (1) Development of shielded hangar for aircraft/aircraft-components compatibility testing.
- (2) Development of traversing rake to measure in-flight net thrust.
- (3) Work on automatic carrier landing concept.

CURRENT IMPORTANT EFFORTS: In FY 1966, 450 projects were in progress; 60 out of 108 maximum-effort projects support Southeast Asia, for example:

- (1) Electronic countermeasures involving testing and compatibility.
- (2) New navigation systems.
- (3) Advanced antisubmarine-warfare projects--ANEW and HATS.
- (4) SATS (short-airfield tactical support).

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Expected for FY 1968 are 520 projects, 93 supporting Southeast Asia:

- (1) Visual landing aids (VAL).
- (2) Automatic carrier landing systems.
- (3) Testing of F-111, A-7, C2A, A6A, 7A4F, FJ4 and CH-53 aircraft.
- (4) Vertical takeoff and short takeoff and landing (V/STOL).

NAME AND LOCATION: Naval Air Test Facility (Ship Installations)  
Lakehurst, New Jersey

COMMAND: Naval Air Systems Command

Commanding Officer: Captain James C. Lieber

Technical Assistants: Mr. Alfred Leone and Mr. Nicholas Ivanovic

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5.978	5.980	6.000
Total in-house RDT&E *	5.282	5.552	5.512
Annual operating cost *	5.190	2.200	2.200
Total RDT&E program	5.596	5.820	5.900
Total procurement program	2.344	2.300	2.300
Total O&M program	0.185	0.250	0.260
Total other programs	0.509	0.588	0.509
Total annual lab. program	8.634	8.958	8.969

Note: \*Included in the totals.

\* NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	171	0	7	164
Civilian	482	0	80	402
Total	653	0	87	566

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
2500**	53,550	30,498	78,854	162,902	31.609

Note: \*\*Classes I and II property owned by Naval Air Station, Lakehurst.

MISSION: To conduct tests and evaluation of launching, recovery and visual-launching-aid systems and related equipment. To provide test sites, facilities and support services for developmental tests of ship-installation equipment. To conduct R&D of equipment and instrumentation used in tests and evaluation of ship-installation equipment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) CEI-3 catapult--test and evaluation for SATS (short airfield tactical support) program. (2) TC-13, Mod 1, catapult installation. (3) Rotary retraction engine. (4) RALS (runway arresting landing site) reconfiguration to simulate shipboard operation. (5) Seat-ejection device.

CURRENT IMPORTANT EFFORTS: (1) Mark VII, Mod 3 arresting systems for use on aircraft carriers. (2) TE-28 emergency arresting system. (3) SATS arresting gear M-21. (4) Wire rope testing. (5) Dry accumulator testing.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Advanced catapult installation. (2) Integrated control station installation. (3) Automatic catapulting. (4) SATS reel-type catapult. (5) High-cycle dead-load launcher to shoot test loads into arresting gear.

NAME AND LOCATION: Naval Air Turbine Test Station  
Trenton, New Jersey

COMMAND: Naval Air Systems Command

Commanding Officer: Captain J. S. Marrow

Technical Director: Commander A. A. Lemeschewsky

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5.044	5.275	5.540
Total in-house RDT&E*	4.311	4.701	4.946
Annual operating cost*	0.800	0.840	0.882
Total RDT&E program	5.701	6.315	6.632
Total procurement program	1.389	1.451	1.485
Total O&M program	0.001	0.005	0.002
Total other programs	0.733	0.376	0.394
Total annual lab. program	7.824	8.147	8.513

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	12		8	4
Civilian	500		70	430
Total	512		78	434

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
65.61	342,304	64,293	1221,476	628,073	42,716	4,512

MISSION: To test and evaluate aircraft gas-turbine engines. To perform applied research and development leading to correction of engine design deficiencies.

PAST SIGNIFICANT ACCOMPLISHMENTS: Engines tested: (1) Allison J71-A-2, J71-A-2E, J71-A-6, T40-A-10. (2) Curtiss-Wright J65-W-4, J65-W-10, J65-W-16, J65-W-16A, J65-W-18, J65-W-4B. (3) General Electric J79-GE-2, J79-GE-3A, J79-GE-8, J79-GE-15, experimental GE-1. (4) Pratt & Whitney J52-P-6, J52-P-6A, J60-P-3A, J57-P-16, J57-P-20, J75-P-2, J75-P-13, J75-P-13B, YTF30-P-1. (5) Westinghouse J34-WE-46, J34-WE-48, J54-WE-2.

CURRENT IMPORTANT EFFORTS: Engines being tested:

- (1) Continental J69-T-6.
- (2) Curtiss-Wright experimental J65 with variable area turbine.
- (3) General Electric J79-GE-8, J79-GE-10/-17.
- (4) Pratt & Whitney J52-P-6A, J52-P-8, J50-P-6, TF30-P-1, TF30-P-3, TF30-P-E.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

- (1) Advanced versions of TF-30.
- (2) Engine for VFAX aircraft.
- (3) Engine for VAX aircraft.

NAME AND LOCATION: Pacific Missile Range  
 Point Mugu, California  
 COMMAND: Naval Air Systems Command  
 Commander: Rear Admiral R. N. Sharp  
 Technical Director: Mr. W. Miller

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	42.533	42.535	47.463
Total in-house RDT&E *	32.265	32.507	37.000
Annual operating cost *	42.533	42.535	47.463
Total RDT&E program	58.249	58.503	64.000
Total procurement program	1.239	2.195	6.705
Total Q&M program	2.141	2.327	2.634
Total other programs	8.846	8.641	10.014
Total annual lab. program	70.475	71.666	83.353

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA-END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1,275	0	136	1,071
Civilian	2,765	4	475	2,334
Total	4,040	4	611	3,405

SPACE AND PROPERTY

Acres	Space (square feet)				Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property	Equipment
27,026	34,484	206,753	2,663,034	2,904,271	91.600//	92.100//

Note: \*\*28 acres leased. //Excluding ships and aircraft.

MISSION: To provide range support for the Department of Defense and other designated government agencies for launching, tracking and collecting data in guided-missile, satellite and space-vehicle research, development, evaluation and training program and actual operation.

PAST SIGNIFICANT ACCOMPLISHMENTS: Provided range support for MERCURY, GEMINI, NIMBUS, TIROS, DISCOVERER, SNAPSHOT, RELAY, TITAN, ECHO, MINUTEMAN, ABRES, NIKE-ZEUS Target Program, CLEANSWEEP, SKOL and many other programs for NASA, Air Force, Army, AEC and Weather Bureau; and testing for the Navy's own weapons such as REGULUS. Provided Navy operating forces with capabilities for training with TALOS, TARTAR, SIDEWINDER, SPARROW, HAWK and other in-service weapons.

CURRENT IMPORTANT EFFORTS: Provides support for national space programs such as GEMINI, NIMBUS, OAO, EXPLORER, ABRES, NIKE-ZEUS and NIKE-X targets and Navy's BULLPUP and SHRIKE. Provides Operating Forces with capabilities for training with TALOS, TARTAR, SIDEWINDER and SPARROW. Provides support for missile and space programs of friendly foreign governments.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Provide support for APOLLO, PHOENIX, ABRES and future weather and communications satellites. Support testing and evaluation of Navy's electronic-warfare standard missile and point defense system. Provide operating forces with capabilities for training and development of tactics involving TALOS, TARTAR, standard missile, SIDEWINDER, SPARROW, torpedoes, SUBROC, ASROC and other in-service weapons.

NAME AND LOCATION: Naval Missile Center  
 Point Mugu, California  
 COMMAND: Naval Air Systems Command  
 Commander: Captain C. O. Holmquist  
 Technical Director: Mr. D. F. Sullivan

PROGRAM DATA BY FISCAL YEAR (in \$ millions)†

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	10,600	13,602	16,144
Total in-house RDT&E*	8,200	9,783	10,343
Annual operating cost *	5,200	5,800	6,400
Total RDT&E program	14,322	23,559	25,309
Total procurement program	5,348	4,448	5,202
Total D&M program	1,461	1,756	1,912
Total other programs	0,490	0,085	0,250
Total annual lab. program	21,621	29,848	32,673

Note: \*Included in the totals.

†NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1,224	3	110	916
Civilian	1,013	6	381	563
Total	2,237	9	491	1,479

SPACE AND PROPERTY

Acres	Space (square feet)				Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property	Equipment
4,253	241,016	61,847	1592,222	895,085	16,894	20,233

MISSION: To conduct laboratory and flight tests and evaluation of naval guided missiles, their components and weapon systems. To provide services and support to the Pacific Missile Range. To provide supporting services relating to planning, development, evaluation and training in the field of astronautics and bioscience.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Total air weapons-systems performance-evaluation program (TAWs/PEP) for all air-launched missiles. (2) SPARROW III missile. (3) Compatibility tests of ATDS/MTDS/NTDS (airborne, Marine and Naval tactical data systems) and E2A aircraft. (4) SEA LAB II support. (5) PRESS (airborne)-- Pacific Range electronic-signature studies. (6) Airborne infrared countermeasures (CM).

CURRENT IMPORTANT EFFORTS: (1) TAWs/PEP continuing. (2) SHRIKE missile. (3) WALLEYE missile. (4) Engineering cognizance of in-service air-launched weapon systems. (5) CM and counter-countermeasures relating to Southeast Asia.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
 (1) PHOENIX missile. (2) A7A assists in BIS (Board of Inspection and Survey) trials for missile/aircraft compatibility. (3) Improved in-service engineering for air-launched weapon systems. (4) Countermeasures. (5) Test and evaluation of air-launched weapon systems.

NAME AND LOCATION: U. S. Naval Ordnance Missile Test Facility  
 White Sands, New Mexico  
 COMMAND: Naval Ordnance Systems Command  
 Commanding Officer: Captain H. A. Rumberg  
 Chief Engineer: W. W. Bohm

PROGRAM DATA BY FISCAL YEAR (in \$ millions)†

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.300	1.337	1.370
Total in-house RDT&E *	0.510	0.714	0.733
Annual operating cost*	0.460	0.496	0.512
Total RDT&E program	0.850	1.064	1.093
Total procurement program	0.020	0.030	0.030
Total O&M program	0	0	0
Total other programs	1.330	1.353	1.572
Total annual lab. program	2.200	2.447	2.695

Note: \*Included in the totals.

†NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	209	0	9	208
Civilian	88	0	2	66
Total	297	0	11	274

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
112	71,199	31,719	/235,131/	338,049	5.173 2.497

MISSION: Support Navy guided-missile and rocket programs, including ground and flight testing. Participate in the operation of the Department of Defense National Missile Test Range at White Sands.

PAST SIGNIFICANT ACCOMPLISHMENTS: Successfully fired forerunner of the present TALOS. Consolidated all the surface missile systems for land test firing (excluding shipboard flight tests).

CURRENT IMPORTANT EFFORTS: Assists NASA with the AEROBEE program. Also acts as sponsor for the test programs of various laboratories, such as SPEED BALL (reentry physics) using NIKE-APACHE vehicle.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
 Continued need for overland testing to enable the Navy to keep abreast of current developments in the field for all missile and rocket programs.

NAME AND LOCATION: Naval Explosive Ordnance Disposal Facility (tenant)  
 Indian Head, Maryland  
 COMMAND: Naval Ordnance Systems Command  
 Commanding Officer: Commander J. H. Gano  
 Technical Director: C. P. Jones

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.703	0.871	0.942
Total in-house RDT&E *	0.664	0.621	0.645
Annual operating cost *	0.125	0.134	0.138
Total RDT&E program	0.982	0.930	1.115
Total procurement program	0.467	1.268	1.310
Total O&M program	0.004	0.030	0.030
Total other programs	0.400	0.431	0.442
Total annual lab. program	1,853	2,659	2,897

Note: \*Included in the totals.

ANOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	71		9	59
Civilian	65		11	47
Total	136		20	106

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Total building	Cost (in \$ millions)	
					Real property	Equipment
1.1	33,208	/89,116/		122,324	2,005	0.342

MISSION: Conduct research, development, test and evaluation in technical matters concerning explosive ordnance disposal and rendering-safe procedures for conventional and special weapons, guided missiles, biological and chemical munitions, tools, equipment and techniques (both U. S. and foreign), as required to discharge the Navy's responsibility to the DoD.

PAST SIGNIFICANT ACCOMPLISHMENTS: Expanded joint service providing EOD (explosive ordnance disposal) technician in the Fleet and field with procedural coverage and adequate tools and equipment to cope with U. S. and foreign nuclear, biological, chemical and conventional weapons. Priority tasks have steadily increased in past two years owing to the Vietnam conflict.

CURRENT IMPORTANT EFFORTS: Recent increase in staffing and a marked increase in contracting for finished publications have produced greater output. New weapon-systems development, as a result of action in Southeast Asia, has accelerated requirements for operational evaluation testing from prototype to deployment.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Difficulties have been encountered in providing tested render-safe procedures for Viet Cong ordnance and new deployed U. S. munitions on a timely basis because of lack of lead time and hardware. Facilities need modification to establish reliable development of EOD equipment.

NAME AND LOCATION: Naval Ordnance Unit (tenant)

Key West, Florida

COMMAND: Naval Ordnance Systems Command

Commanding Officer: Commander F. P. Wells

Technical Director: (None)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.943	0.926	0.935
Total in-house RDT&E *	0.943	0.926	0.935
Annual operating cost *	0.285	0.290	0.292
Total RDT&E program	0.996	0.964	1.071
Total procurement program	0.044	0	
Total O&M program	0	0	
Total other programs	0.696	0.722	0.744
Total annual lab. program	1.736	1.686	1.815

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	135		5	141
Civilian	72		3	63
Total	207	-0-	8	204

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
5.4	74,819	16,079	18,223	109,121	1.602	0.486

MISSION: Conduct preproduction and evaluation tests and provide supporting services in connection with development, test, evaluation and analysis of ordnance equipment, principally underwater. Provide logistic and technical support to OPTEVFOR (Operational Test and Evaluation Force) for operational evaluations in the Key West area.

PAST SIGNIFICANT ACCOMPLISHMENTS: No significant changes in Unit's activities, mission or organization. Civilianization program initiated.

CURRENT IMPORTANT EFFORTS: Anticipated demand for computer-facility services to keep abreast of changing technology. It is planned to modify the existing IBM 1620 installation to provide a magnetic-tape capability and procure a new plotter capable of handling tape and punch cards.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: No major problems foreseen. Support required in the next five years has not been provided to the activity, and qualification in this area is necessary.

NAME AND LOCATION: Naval Space Surveillance System (tenant)  
 Dahlgren, Virginia  
 COMMAND: Naval Air Systems Command (Chief of Naval Operations)  
 Commanding Officer: Captain Donald P. Gift  
 Technical Director: Mr. Harold J. Hasenfus

PROGRAM DATA BY FISCAL YEAR (in \$ millions)/\*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5.984	3.560	3.711
Total in-house RDT&E *	1.000	.500	.200
Annual operating cost*	.977	1.115	1.138
Total RDT&E program	1.000	.500	.200
Total procurement program	.900	0	.400
Total O&M program	4.484	4.593	4.869
Total other programs	.168	.173	.173
Total annual lab. program	6.552	5.266	5.642

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	15			
Civilian	115	0	98	17
Total	130	0	98	17

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	1,800	/14,200/	16,000	0	5.534

MISSION: To meet both Navy and national requirements as specified by the Chief of Naval Operations, NORAD (North American Air Defense Command) and higher authority. To maintain constant surveillance of space and identify and determine the orbits of all objects orbiting around the earth at inclinations within system's capability, with particular emphasis on nonradiating objects.

PAST SIGNIFICANT ACCOMPLISHMENTS: Since 1 February 1961, maintained a constant 24-hour surveillance of orbital objects of inclinations 32 degrees or greater. No specific projects may be identified.

CURRENT IMPORTANT EFFORTS: Continuing surveillance of orbital objects.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Plans to increase the capabilities of the Naval Space Surveillance System in regard to the identification of orbital objects.

NAME AND LOCATION: Naval Weapons Evaluation Facility (tenant)  
Kirtland Air Force Base, Albuquerque, New Mexico

COMMAND: Naval Air Systems Command

Commanding Officer: Captain R. W. Jackson

Assistant Director of Projects: Mr. F. B. Rucker

PROGRAM DATA BY FISCAL YEAR (in \$ millions)/

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.046	1.320	1.422
Total in-house RDT&E *	0.662	0.811	0.918
Annual operating cost*	0.119	0.171	0.180
Total RDT&E program	0.662	0.811	0.918
Total procurement program	0	0.002	0.002
Total O&M program	0.237	0.272	0.272
Total other programs	0.147	0.235	0.230
Total annual lab. program	1.046	1.320	1.422

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	203			
Civilian	72	0	44	7
Total	275		44	7

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0	0	20,322	/65,271/	85,593	0	315.0

MISSION: To perform evaluations and tests and conduct safety studies of nuclear weapon systems and aircraft intended to deliver nuclear weapons; and to render services as required by the Board of Inspection and Survey (BIS) for the conduct of trials of naval aircraft. To plan and coordinate the Navy's nuclear weapons safety program to provide information that will assist in preventing accidents and incidents involving nuclear weapons.

PAST SIGNIFICANT ACCOMPLISHMENTS: Determined vulnerability of all Navy nuclear weapons to nuclear, thermoelectromagnetic and shock effects; findings were included in military characteristics of Navy nuclear weapons. Conducted nuclear compatibility portion of BIS trials for new Navy-sponsored aircraft--RA5C, A6A, EA6A, A4E, PA4F, F4B, P3A, SH3A.

CURRENT IMPORTANT EFFORTS: Prepares emergency destruct procedures on an urgent basis for nuclear weapons in danger of capture. Determines sure-kill and survival ranges of Navy ballistic missiles. Provides aircraft and support facilities to Sandia Corporation (AEC) for development of air-launched weapon systems such as Mk 61, BAYONET and REB. Is conducting nuclear compatibility portion of BIS trials for A7 and F-111B aircraft.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Develop techniques of destroying nuclear weapons without detonating warheads. Will continue Sandia Corporation (AEC) development support. Conduct nuclear compatibility portion of BIS trials for F4J, F4M and A7B aircraft. Will continue to prepare all Navy and Marine Corps aircraft check lists for conventional and nuclear weapons systems.

NAME AND LOCATION: U. S. Naval Weapons Materials Handling Laboratory (tenant)  
Department at Naval Ammunition Depot, Earle, New Jersey

COMMAND: Naval Ordnance Systems Command

Commanding Officer: Captain A. B. Register

Technical Director: Mr. Jim Kelly

PROGRAM DATA BY FISCAL YEAR (in \$ millions).<sup>a</sup>

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.886	1.415	2.300
Total in-house RDT&E*	0.529	0.849	1.426
Annual operating cost*	0.348	0.550	0.900
Total RDT&E program	1.421	1.825	2.535
Total procurement program	0.713	5.875	6.000
Total O&M program	0.144	0.500	0.900
Total other programs	0.044	0.063	0.065
Total annual lab. program	2.322	8.263	9.500

Note: \*Included in the totals.

<sup>a</sup>NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1	0	1	0
Civilian	46	0	23	17
Total	47	0	24	17

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
2.5	14,542	858	/28,050/	43,450	0.297	0.183

MISSION: Design, develop, test and evaluate: Methods and equipment proposed for use in packaging, packing and palletizing inert and live ammunition and for handling weapons through logistic movement. Recommend improved handling or transferring methods. Prepare associated documentation and advise of latest industrial handling methods suitable for ordnance requirements.

PAST SIGNIFICANT ACCOMPLISHMENTS: Development of preservation, packaging and handling equipment for: (1) BOMARC (transport missiles cross-country cost savings). (2) SATS (short airfield tactical support). (3) MAUNA LOA, platform for helicopter. (4) Amphibious program. (5) Outloading operations.

CURRENT IMPORTANT EFFORTS: Development of preservation, packaging and handling for: (1) Antisubmarine warfare. (2) Air-launched weapons. (3) SMS (surface missile systems) TERRIER, TARTAR, TALOS and advanced standard missile. (4) Vertical replenishment by helicopter. (5) WISE (weapons installation system evaluation) program.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Design and develop packaging and handling for the following programs: Dockside/ shipside loader; further development of future underway replenishment (helicopter); procurement support of ordnance production material; in-service engineering support and documentation for all Ordnance Systems Command programs of material management support.

NAME AND LOCATION: David Taylor Model Basin  
Carderock, Maryland  
COMMAND: Chief of Naval Material  
Commanding Officer and Director: Captain D. K. Ela, USN  
Technical Director: (vacant)

**PROGRAM DATA BY FISCAL YEAR (in \$ millions)**

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	29.902	31.588	35,500
Total in-house RDT&E *	18.083	20.219	22,816
Annual operating cost*	5.895	6.616	6,947
Total RDT&E program	23.400	25,000	28,000
Total procurement program	0	0	0
Total O&M program	1.528	1,500	2,000
Total other programs	4.974	7,212	5,500
Total annual lab. program	29.902	33,712	35,500

Note: \*Included in the totals.

ANOVA, except for Annual Operating Cost

**PERSONNEL DATA--END OF PRIOR FISCAL YEAR**

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	41	1	12	33
Civilian	1,927	33	585	1,281
Total	1,968	34	597	1,314

## SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
186.2	766,122	86,771	1,429,538	1,282,431	42,400	30,900

**MISSION:** To perform research, development, test and evaluation in hydrodynamics, structural mechanics, aerodynamics, acoustics, vibration, mathematical analysis, computer techniques and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed structural concepts and design for all DSSP (deep-sea submergence program) vehicles, 1965. (2) Developed R&D information system (NARDIS), used in July 1965. (3) Produced tenfold reduction in long-range submarine detectability, 1963. (4) Synthesized air-cushion ship concepts for 100-knot Navy, 1965. (5) Developed emergency maneuvers for Fleet submarines, 1965.

CURRENT IMPORTANT EFFORTS: (1) Overcome weapon-release problem of ground support aircraft. (2) Integrate next-generation sonar into advanced ASW ship hulls. (3) Develop explosion protection measures to maximize Fleet effectiveness. (4) Exploit computers for drastically advancing ship concepts and construction. (5) Remove sonar performance limitation by reducing self-noise.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: To integrate its disciplines (hydrodynamics, structures, etc.) into a true laboratory for ships, strengthened by coordination with other Navy laboratories and industry. The means is research-project formulation across disciplines, such as advanced ship concepts, air-cushion ships, experimental submarines, and systematic projects in shock and silence.

NAME AND LOCATION: U. S. Naval Applied Science Laboratory  
Brooklyn, New York

COMMAND: Chief of Naval Material

Commanding Officer and Director: Captain T. T. McGillicuddy

Technical Director: Edward Jehle

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	25.682	26.497	25.568
Total in-house RDT&E *	14.024	15.162	15.800
Annual operating cost *	4.850	5.760	6.000
Total RDT&E program	23.748	24.289	23.400
Total procurement program	0.258	0.341	0.300
Total O&M program	1.551	1.521	1.400
Total other programs	0.125	0.346	0.468
Total annual lab. program	25.682	26.497	25.568

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	6	0	6	0
Civilian	1,039	7	452	594
Total	1,045	7	458	594

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
11.8	233,800	51,830	/106,300/	391,930	4.800 0.600

MISSION: To perform research, development, test and evaluation in materials, electronics, navigation systems, chemical and biological warfare defense, and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed for Fleet use: (1) Precise navigation systems for POLARIS/SSB(N) submarines. (2) Helium speech unscrambler. (3) Methodology of systems-performance effectiveness (SPE). (4) Deep-submergence hull materials and fabrication techniques, corrosion protection systems and sound damping, buoyancy and decking materials. (5) CW-agent detection devices.

CURRENT IMPORTANT EFFORTS: Development of: (1) Precise navigation systems for POLARIS/POSEIDON SSB(N)s, ocean minesweepers and DSSP (deep-sea submergence program) search and rescue vehicles. (2) SPE principles as applied to all shipboard systems in particular, ASW (SQS-26) sonar. (3) Shipboard integrated interior communication (IC) systems. (4) Advanced deep-submergence hull materials and fabrication techniques. (5) BW (biological warfare) and CW defense and decontamination devices and techniques.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
(1) Advanced non-shore-dependent primary navigation systems for all naval vessels, including DSSP. (2) Communication systems for all DSSP applications and advanced IC and ships information transfer systems. (3) SPE for use in computer-aided ship design. (4) Deep-submergence material development. (5) Fleet BW/CW defense.

NAME AND LOCATION: U. S. Navy Electronics Laboratory  
 San Diego, California  
 COMMAND: Chief of Naval Material  
 Commanding Officer and Director: Captain W. R. Boehm, USN  
 Technical Director: Dr. R. J. Christensen

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	43.220	41.824	42.350
Total in-house RDT&E *	23.021	22.625	24.000
Annual operating cost *	5.510	5.800	6.000
Total RDT&E program	40.211	38.836	40.000
Total procurement program	0.066	0.800	0.100
Total O&M program	1.268	0.558	0.500
Total other programs	1.675	1.630	1.750
Total annual lab. program	43.220	41.824	42.350

Note: \*Included in the totals.

ANOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	123	1	32	131
Civilian	1,623	37	642	924
Total	1,746	38	674	1,055

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
2837.8	630,541	100,338	/266,972/	997,851	15.000	17.900

MISSION: To perform research, development, test and evaluation in surface, air and underseas surveillance, communications, identification, navigation, classification, electronic warfare and countermeasures, command and control, data processing and display, oceanography, human factors and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: Design, development and technical validation of (1) NTDS and (2) OMEGA--VLF radio worldwide navigation system. (3) Development of long-range (to 90 miles) sonar detection of submarines from a submarine. (4) Design, development, and installation of Navy electronic-warfare simulator (NEWS) for Navy War College. (5) Design and development and removal of Fleet difficulties in HARE--a classified project of the Naval Security Group.

CURRENT IMPORTANT EFFORTS: (1) FASOR--forward-area (Pacific) sonar characteristics and effectiveness measurement. (2) Minimal intercept probability IFF (identification friend or foe) and navigation design and development. (3) PAIR, SQS-23 sonar improvement program. (4) Design and effectiveness determination of next-generation submarine sonar and fire-control systems. (5) Design, development and effectiveness test of ASW command and control systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Design and develop integrated communication systems for shipboard. (2) Satellite relay communication for ships. (3) Technical evaluation of the 4,000-foot DOLPHIN for acoustic detection. (4) Antijam and low-probability-intercept communications and surveillance. (5) Sonar countermeasure systems to assist U.S. Naval offense.

NAME AND LOCATION: U. S. Navy Mine Defense Laboratory  
 Panama City, Florida  
 COMMAND: Chief of Naval Material  
 Commanding Officer and Director: Captain J.D.W. Borop, USN  
 Technical Director: Dr. Norman Jasper

PROGRAM DATA BY FISCAL YEAR (in \$ millions)/

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	11.513	12.245	12.850
Total in-house RDT&E *	6.610	8.360	8.336
Annual operating cost*	2.556	2.774	2.900
Total RDT&E program	8.862	10.395	11.000
Total procurement program	0.162	0.150	0.150
Total O&M program	0.217	0.200	0.200
Total other programs	2.369	1.500	1.500
Total annual lab. program	11.610	12.245	12.850

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	142	1	2	158
Civilian	640	9	258	370
Total	782	10	260	528

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Total building	Cost (in \$ millions)	
					Real property	Equipment
651.4	121,892	34,096	/319,758/	475,746	13.700	4.800

MISSION: To perform research, development, test and evaluation in mine defense, acoustic and torpedo countermeasures, inshore warfare, and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) High-definition sonars; detection of mines and swimmers. (2) Systems and doctrines for mine and torpedo countermeasures (CM). (3) Vietnam--small river boats, minesweep gear, swimmer-delivery vehicles. (4) Studies for new mine-CM ships, inshore and mine warfare. (5) Man-in-the-Sea--Built SEALAB I; preliminary design of SEALAB II; trained all aquanauts.

CURRENT IMPORTANT EFFORTS: (1) Systems for torpedo defense; mine CM; swimmer defense and delivery. (2) Mine CM for inland waterways (Vietnam, etc.). (3) Mine-warfare study requested by Secretary McNamara. (4) CM for buried mines. (This is a severe threat.) (5) Develop inshore and unconventional-warfare capabilities.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

Development of: (1) Mine countermeasures; (2) torpedo and acoustic countermeasures; (3) inshore undersea-warfare capability (submarines, sneak craft, swimmers). (4) R&D on unconventional warfare and counterinsurgency. (5) Man-in-the-Sea, including SEAL (sea-air-land), UDT (underwater demolition teams) and EOD-team capabilities.

NAME AND LOCATION: U. S. Navy Marine Engineering Laboratory

Annapolis, Maryland

COMMAND: Chief of Naval Material

Commanding Officer and Director: Captain F. A. Hooper, USN

Technical Director: Harold V. Nutt

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	16.925	17.635	19.352
Total in-house RDT&E *	11.400	11.800	11.000
Annual operating cost*	3.300	3.686	3.850
Total RDT&E program	14.748	15.100	16.000
Total procurement program	0	0	0
Total O&M program	1.000	1.116	1.239
Total other programs	1.177	1.419	2.113
Total annual lab. program	16.925	17.635	19.352

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	6	0	2	4
Civilian	910	15	365	544
Total	916	15	367	548

SPACE AND PROPERTY

Acres	Laboratory	Administrative	Other	Space (square feet)		Cost (in \$ millions)	
				Total	building	Real property	Equipment
65.9	224,754	34,782	/103,416/	362,952		11.500	6.500

MISSION: To perform research, development, test and evaluation on Naval shipboard machinery systems and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: Tenfold reduction in the radiated and self-noise signatures of nuclear submarines by the control of machinery-initiated vibrations. Developed titanium alloy, not subject to stress corrosion, suitable for deep-diving pressure hulls. Developed thermoelectric refrigerator and improved quiet gears, shaft seals, air compressors and fire-resistant hydraulic fluids.

CURRENT IMPORTANT EFFORTS: Energy-conversion devices (fuel cells, thermionics and thermoelectrics) to provide major advances in power for ships, submarines and buoys. Deep-ocean simulation testing, deep-submergence-vehicle studies, silencing small craft, improved submarine safety. CVA voltage regulation, boiler water treatments, atmosphere purification, bearing failures and magnetic-field reduction.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Advanced lightweight, quiet machinery and life-support systems for operation in sea water at great depths. Develop machinery and control systems for large, high-speed surface-effect ships. Develop advanced amphibious assault craft. reliability, maintainability, performance, cost and readiness of ship propulsion and auxiliary machinery systems. Advanced automated ship control systems.

NAME AND LOCATION: U. S. Naval Radiological Defense Laboratory

San Francisco, California

COMMAND: Chief of Naval Material

Commanding Officer and Director: Captain D. C. Campbell, USN

Technical Director: Dr. E. P. Cooper

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	12,312	11,192	11,480
Total in-house RDT&E*	7,996	8,827	8,865
Annual operating cost*	2,900	3,068	3,170
Total RDT&E program	13,630	12,523	13,000
Total procurement program	0	0	0
Total O&M program	0.180	0.180	0.180
Total other programs	1.095	0.289	0.300
Total annual lab. program	14,905	12,992	13,480

Note: \*Included in the totals.

ANOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	64	8	46	0
Civilian	575	58	272	287
Total	639	66	318	287

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
619	109,500	69,100	127,500	454,100	9,800	4,600

MISSION: To perform research, development, test and evaluation of the effects of nuclear explosions, natural and controlled nuclear processes, nuclear accidents and incidents, and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Definition of nuclear-warfare doctrine and tactics. (2) Development of base surge model. (3) Post-SIOP reconnaissance study. (4) Target vulnerability analyses for shipyards. (5) Definition of threat to Naval forces from biological/chemical warfare.

CURRENT IMPORTANT EFFORTS: (1) Threat analysis for ship-concept formulation. (2) Missile-vulnerability studies. (3) Study on vulnerability of Navy systems to EMP (electromagnetic pulse) and nuclear radiation. (4) Analysis of biological effects vs. combat effectiveness. (5) Open-ended collating system for information on weapons effects.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Expertise in nuclear effects for Navy and DoD. (2) Develop radiation instrumentation for submarines (special-purpose). (3) Develop missile-hardening techniques. (4) Develop hardening techniques against EMP and nuclear radiation. (5) Develop doctrine of realistic nuclear exercises for Fleet.

NAME AND LOCATION: U.S. Navy Underwater Sound Laboratory  
 New London, Connecticut  
 COMMAND: Chief of Naval Material  
 Commanding Officer and Director: Captain R. L. Corkran, Jr., USN  
 Technical Director: Harold E. Nash

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	24.280	22.767	24.700
Total in-house RDT&E *	13.532	14.565	15.000
Annual operating cost *	4.116	4.261	4.460
Total RDT&E program	22.209	20.106	22.000
Total procurement program	0.235	0.200	0
Total O&M program	0.205	0.620	0.700
Total other programs	1.631	1.841	2.000
Total annual lab. program	24.280	22.767	24.700

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	58	1	5	70
Civilian	1,064	9	370	639
Total	1,122	10	375	709

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
112	243,166	44,848	/267,983/	555,997	12.700	8.200

MISSION: To perform research, development test and evaluation in surface and underseas surveillance, submarine communications, classification, oceanography and related fields of science and engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: Conceived, specified and directed development of (1) BQQ-2 submarine sonar and (2) SQS-26 surface-ship sonar. (3) Conceived and developed floating wire antenna for POLARIS and attack subs. (4) Developed advanced sonar-system design and performance-prediction techniques. (5) Advanced knowledge of acoustics in Norwegian Sea and Atlantic and Arctic Oceans.

CURRENT IMPORTANT EFFORTS: (1) Development of new submarine integrated sonar system (SISS). (2) Broad-spectrum R&D effort in underwater acoustic communications. (3) Development of integrated submarine radio communication system. (4) Transition engineering introducing BQQ and SQS-26 into the Fleet. (5) Oceanographic and acoustics research program for future sonar systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

- (1) Development of a major active/passive ocean-surveillance sonar system.
- (2) Development of comprehensive system for quantitative acoustic-intelligence acquisition. (3) Development of major-ocean-basin acoustic communication system. (4) Exploitation of reliable acoustic path for deep submersibles.
- (5) Development of follow-on mobile sonar surveillance systems.

NAME AND LOCATION: Naval Medical Research Institute  
 National Naval Medical Center, Bethesda, Maryland 20014  
 COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain H. C. Sudduth, MC USN  
 Technical Director: Francis Gordon, Ph.D., M. D.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)†

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.999	3.766	3.813
Total in-house RDT&E *	4.351	4.600	4.600
Annual operating cost *	0.565	0.567	0.570
Total RDT&E program	2.825	2.586	2.685
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	1.174	1.180	1.128
Total annual lab. program	3.999	3.766	3.813

Note: \*Included in the totals.

†NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	152	9	58	81
Civilian	158	26	92	49
Total	310	35	150	130

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
5.5	57,456	16,775	79,209	153,440	3.313	1.559

MISSION: To conduct basic and applied research and development that relate to the health, safety and efficiency of Naval personnel. It is located in Bethesda, Maryland, because of its proximity to the Bureau of Medicine and Surgery, and it can readily respond to any requirement of this nerve center of medical activity.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed methods for storage of human tissues for use in reparative surgery. (2) Demonstrated relationship between dietary deficiencies and bladder-stone formation. (3) Studied human heat balance in cold marine environments. (4) Provided basic information on stannous chloride in prevention of dental caries. (5) Developed improved methods for cultivation of malaria parasites in tissue cultures.

CURRENT IMPORTANT EFFORTS: (1) Effects of prolonged isolation and confinement on small-crew effectiveness (Project ARGUS). (2) Clinical studies on stored skin in burn treatment. (3) Studies on tissue saturation under high-pressure diving gas mixtures. (4) Effects of antimalarial drugs on susceptible and resistant malaria parasites. (5) Physiologic effects of plasma substitutes and expanders in hemorrhagic shock.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
 (1) Continuation of human-factors studies in future undersea systems.  
 (2) Development of methods for storage of living whole organs. (3) Effects of high-pressure gas mixtures on tissue structure and function. (4) Study therapeutic efficiency of drugs in hyperbaric environments. (5) Development of tissue- and organ-typing methods.

NAME AND LOCATION: U. S. Naval Aerospace Medical Institute  
                          U. S. Naval Aviation Medical Center, Pensacola, Florida 32512  
 COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain H. C. Hunley, MC USN  
 Technical Director: Ashton Graybiel, M. D.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.611	1.085	1.097
Total in-house RDT&E *	1.239	0.785	0.795
Annual operating cost *	0.191	0.192	0.194
Total RDT&E program	1.239	0.785	0.795
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	1.372	0.300	0.302
Total annual lab. program	2.611	1.085	1.097

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	41	3	17	18
Civilian	92	4	17	30
Total	133	7	34	48

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrativ.	Other	Total building	Real property
2.7	101,502	4,456	12,917	118,875	2.523

MISSION: To conduct research in aviation and space medicine, aviation psychology and allied fields; evaluate aeromedical equipment; and provide professional and consulting services in aviation medical matters. This unit is located at Pensacola, Florida, because of the area's aviation and aerospace facilities.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Radiation monitoring on Projects MERCURY and GEMINI. (2) Measurement of cardiac output by new thermodilution method of telemetry. (3) Tests and measuring method of otolith function. (4) Pilot orientation during complex accelerations of flight. (5) Automation of aviation selection and training for prediction of training success or failure of marginal flight students.

CURRENT IMPORTANT EFFORTS: (1) Prospective study of Naval aviators. (2) Study of survival and performance of man under unusual environmental conditions. (3) Provision of data for Training Command (Pensacola) decisions. (4) Health hazards due to ionizing radiation. (5) Role of vestibular organs in causing disorientation in flight and motion sickness.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Generation of new requirement for initial selection and subsequent medical evaluations of U. S. Naval aviators. (2) Respiration studies. (3) Reduction of flight hazards associated with visual, vestibular and auditory function in flight. (4) Cardiology. (5) Use of computer to improve aviation training.

NAME AND LOCATION: U. S. Naval Submarine Medical Center  
 Naval Submarine Base, New London, Groton, Connecticut 06342

COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain C. L. Waite, MC USN

Technical Director: C. F. Gell, M. D.

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.063	1.104	1.029
Total in-house RDT&E *	0.916	0.956	0.880
Annual operating cost *	0.203	0.204	0.205
Total RDT&E program	0.916	0.956	0.880
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.147	0.148	0.149
Total annual lab. program	1.063	1.104	1.029

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	20	1	7	12
Civilian	52	9	37	21
Total	72	10	44	33

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
1.5	59,894	6,200	0	66,094	1.020	0.577

MISSION: To conduct medical research and development in training of medical personnel in submarine, shipboard and diving medicine. This unit is located in New London, Connecticut, because of the submarine environment and the operational availability of Navy submarines.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Physiological and psychological studies in support of SEALABS I and II. (2) Development of computer method (STANDIVE) for decompression table calculation. (3) Development and evaluation of oxygen therapy tables for decompression sickness. (4) Evaluation of habitability and atmosphere-control problems aboard nuclear submarines. (5) Establishment of preliminary safety standards for laser use.

CURRENT IMPORTANT EFFORTS: (1) Physiological and psychological studies for SEALAB III, etc. (2) Team interaction in man-machine systems, particularly submarine system effectiveness. (3) Computer programming to solve diving decompression equations. (4) Long-term biologic effects of regenerated atmosphere aboard nuclear subs. (5) Human enzymatic response to environmental challenges, especially prolonged exposure to artificial atmospheres.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
 (1) Physiological and psychological hyperbaric research. (2) Biologic effect of exposure to various artificial atmospheres, both submarine and diving.  
 (3) Human-factors aspects of man-machine systems, particularly advanced submersibles. (4) A clinical hyperbaric treatment center. (5) Physical and psychologic personnel-selection criteria for submarine and diving operations.

NAME AND LOCATION: Naval Medical Field Research Laboratory  
 Camp Lejeune, North Carolina  
 COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain C. H. Boyers, MC USN  
 Technical Director: (none)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	.819	.740	.800
Total in-house RDT&E *	.382	.310	.360
Annual operating cost *	.026	.028	.029
Total RDT&E program	.382	.310	.360
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.437	.430	.440
Total annual lab. program	.819	.740	.800

Note: \*Included in the totals.

'NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	30	2	12	16
Civilian	31	1	4	15
Total	61	3	16	31

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
1.1	34,626	5,097	9,978	49,701	0 0.236

MISSION: To conduct basic research, applied research, development and testing in the dental, medical and allied sciences, with particular emphasis on those medical problems peculiar to amphibious and field operations. This unit is located at Camp Lejeune because of the availability of large numbers of Marine personnel and varied land topography peculiar to amphibious and field operations.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Identified the etiology of atypical pneumonia, broad-spectrum antibiotics and definition of behavior of organism. (2) Developed and tested live oral vaccine for Adenovirus 4 in recruits. (3) Method of acclimatization of troops bound for duty in hot, humid climates. (4) Improved system of physical training. (5) Discovered and identified T-strain mycoplasma as most common cause of non-monococcal urethritis in males; its behavior, growth and cultural characteristics.

CURRENT IMPORTANT EFFORTS: (1) Physical fitness and heat conditioning of troops. (2) Improved Eaton agent vaccine. (3) Efficacy of erythromycin in curing urethritis. (4) Prevention of immersion foot (wet-foot syndrome), method suitable for field use. (5) Improved personal protection from malaria mosquitoes.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Physiology of physical fitness and heat conditioning of troops. (2) Improved body-armor garments for protection and effect on physical performance due to design and weight. (3) Human factors in relation to combat equipment of the future. (4) Meningococcus studies (environment, vaccines, laboratory methods, etc.) (5) Evaluation of rubella vaccines.

NAME AND LOCATION: U. S. Navy Medical Neuropsychiatric Research Unit

San Diego, California 92152

COMMAND: Bureau of Medicine and Surgery

Officer in Charge: Commander R. J. Arthur, MC USN

Technical Director: W. L. Wilkins, Ph. D.

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	478	445	.411
Total in-house RDT&E *	323	365	.330
Annual operating cost *	.022	.023	.024
Total RDT&E program	323	365	.330
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	155	.080	.081
Total annual lab. program	478	445	.411

Note: \*Included in the totals.

\*NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	9	1	5	4
Civilian	33	5	9	23
Total	42	6	14	27

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0.25	6,700	500	2,400	9,600	.056
					.080

MISSION: To conduct research in the field of neurophysiatry as it applies to the Naval service. This unit is located in San Diego because of the availability of large numbers of Fleet, Marine and shore-based personnel; a large Naval hospital; computer facilities, and excellent academic environment.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed data and report on the utility of psychiatric evaluation units in recruit training. (2) Prediction of 2-year adjustment of Navy and Marine enlistees. (3) Psychophysiological study of flicker fusion in helicopter pilots and in single-seizure (epilepsy) cases. (4) Develop psychiatric screening program for Operation Deep Freeze. (5) Prediction of adjustment to confined, isolated duty in Antarctica.

CURRENT IMPORTANT EFFORTS: (1) Prediction of 4-year adjustment of Navy and Marine enlistees. (2) Study problems of group functioning under confined, isolated conditions. (3) Epidemiology of mental illness in the Naval service. (4) Psychophysiological study of fatigue and sleep deprivation. (5) Research on selection of personnel for counterinsurgency forces (underwater demolition teams).

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Continue epidemiology of mental illness, with emphasis on environmental analysis. (2) Study adjustment of Naval personnel returned to duty from psychiatric treatment. (3) Study the effect on performance of special training units (i.e., motivation platoons) in recruit training. (4) Continue psychophysiological studies of fatigue and sleep deprivation. (5) Continue research on selection for unusually stressful duty assignments.

NAME AND LOCATION: U. S. Naval Blood Research Laboratory  
 Naval Hospital, Chelsea, Massachusetts 02150  
 COMMAND: Bureau of Medicine and Surgery  
 Officer in Charge: Lt. Commander C. R. Valeri, MC USNR  
 Technical Director: (none)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)/

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	.287	.375	.380
Total in-house RDT&E *	.287	.375	.380
Annual operating cost*	.020	.021	.023
Total RDT&E program	.287	.375	.380
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0	0	0
Total annual lab. program	.287	.375	.380

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	7	0	4	4
Civilian	8	0	0	3
Total	15	0	4	7

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0.28	11,984	0	0	11.984	.139	.086

MISSION: To conduct research in methods for the long-term preservation of blood, and to investigate its clinical usefulness in hospital and operational areas. This unit is located in Chelsea because the Boston area is recognized as the center for blood investigation, and available consultants are invaluable to this program.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Extensive *in vitro* and *in vivo* studies of frozen blood processed by the Colin Fractionation Method and the Huggins Method. (2) Significant advances in understanding the nature of the physical and mechanical changes in the frozen thawed red cell. (3) Established first frozen-rare-blood bank. (4) Developed mobile frozen-blood bank. (5) Developed system for transporting frozen blood.

CURRENT IMPORTANT EFFORTS: (1) Frozen-blood feasibility study in Vietnam. Advanced development of (2) frozen-blood-bank system and (3) automated system for determining *in vivo* survival of preserved red cells. (4) Clinical evaluation of frozen blood in selected patients. (5) Evaluation of potential of frozen-blood processing to reduce or eliminate threat of serum hepatitis.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Evaluation of (1) Successor method for long-term preservation of red cells; (2) methods for long-term preservation of blood platelets; (3) methods for the long-term preservation of white blood cells; and (4) methods for extending the shelf life of refrigerated blood. (5) Continued research on basic mechanism of freeze thaw damage and action of cryoprotective additives.

NAME AND LOCATION: U.S. Naval Medical Research Unit No. 1, Building T-19  
 University of California, Berkeley, California 94720  
 COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain F. M. Morgan, MC USN  
 Technical Director: (None)

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	.227	.237	.231
Total in-house RDT&E*	.091	.101	.095
Annual operating cost*	.010	.011	.012
Total RDT&E program	.091	.101	.095
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.136	.136	.136
Total annual lab. program	.227	.239	.231

Note: \*Included in the totals.

ANOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	20	2	7	11
Civilian	0	0	0	0
Total	20	2	7	11

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
0.04	1,960	474	None	2,434	.027	.170

MISSION: To conduct medical research in airborne infectious diseases and participate in those portions of the Naval Biological Laboratory's (NBL) research investigations as the Unit's Commanding Officer considers to be in the interest of the Bureau of Medicine and Surgery. It is located on the Berkeley Campus because of the academic environment and the excellent Life Sciences Program at the university.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Participated in relevant NBL classified investigations. (2) Laboratory studies on airborne infection. (3) Physiologic studies on cold-weather stress. (4) Developed procedure for storage of cells for tissue culture. (5) Developed vaccine against Coccidioidomycosis.

CURRENT IMPORTANT EFFORTS: (1) Methods for rapid identification of infectious agents. (2) Methods and equipment for collection and transportation of microbiological specimens under field conditions. (3) Dissemination of infectious aerosols from dental procedures. (4) Studies of acute respiratory disease in POLARIS submarines. (5) Biologic characteristics of meningococci.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Elaboration of exotic BW-agent identification capabilities. (2) Development of countermeasures against newer BW agents. (3) Survival of infectious agents under various environmental conditions. (4) Training of medical-department personnel in BW defense measures. (5) Development of medical countermeasures against BW.

NAME AND LOCATION: U. S. Naval Medical Research Unit No. 2  
 Taipei, Taiwan, Republic of China  
 COMMAND: Bureau of Medicine and Surgery  
 Commanding Officer: Captain R. H. Watten, MC USN  
 Technical Director: (none)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1,113	1,066	1,016
Total in-house RDT&E *	.807	.830	.811
Annual operating cost*	.057	.058	.059
Total RDT&E program	.807	.830	.811
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.306	.236	.205
Total annual lab. program	1,113	1,066	1,016

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	26	1	10	14
Civilian	9	2	5	290*
Total	35	3	15	304*

Note: \*Includes 285 foreign nationals.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
2	36,430	38,674	14,196	89,300	0.001	.456

MISSION: To conduct medical research to provide essential information on diseases and medical problems of military significance and biological knowledge required for controlling the animal and insect disease vectors of the Far East. This unit is in Taiwan because of its proximity to Far East areas.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Pathophysiology of Asiatic cholera. (2) Treatment of Asiatic cholera. (3) Classification of trachoma viruses. (4) Development of trachoma vaccine. (5) Distribution of parasitic diseases of Far East.

CURRENT IMPORTANT EFFORTS: (1) Epidemiology of arthropodborne viruses in Southeast Asia. (2) Evaluation of trachoma vaccines. (3) Physiologic and therapeutic studies on Asiatic cholera. (4) Establishment of laboratory support for field studies in DaNang, South Vietnam. (5) Studies of acute diarrheal diseases in military personnel.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: (1) Laboratory studies on malaria. (2) Zoonoses of the Far East. (3) Laboratory studies of arthropodborne viruses. (4) Ecology and immunology of scrub typhus. (5) Epidemiology of leptospirosis in Southeast Asia.

NAME AND LOCATION: U. S. Naval Medical Research Unit No. 3  
Cairo, Egypt, United Arab Republic

COMMAND: Bureau of Medicine and Surgery  
Commanding Officer: Captain Lloyd F. Miller, MC USN  
Technical Director: (None)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	.933	.971	.988
Total in-house RDT&E *	.543	.545	.562
Annual operating cost *	.079	.080	.082
Total RDT&E program	.543	.545	.562
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.390	.426	.426
Total annual lab. program	.933	.971	.988

Note: \*Included in the totals.

\*NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	34	2	13	17
Civilian	132	6	13	79*
Total	166	8	26	96*

Note: \* Foreign nationals.

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
2.5	35,000	6,000	767,900	108,900	.322	.415

MISSION: To perform needed medical research on diseases of military importance that are endemic and epidemic to the Middle East. This unit is located in Cairo because of the availability of areas fertile for medical research, and the proximity of the University of Cairo and other Egyptian medical facilities.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Pathogenesis of schistosomiasis. (2) Viral and rickettsial diseases of the Middle East. (3) Taxonomy and ecology of ticks. (4) Epidemiology of Kala Azar. (5) Relationships of sandfly fever viruses with arthropod vectors.

CURRENT IMPORTANT EFFORTS: (1) Therapy of schistosomiasis. (2) Migratory birds and dissemination of viruses. (3) Relation of arthropods to human disease. (4) Zoonoses of Africa and the Middle East. (5) Chemoprophylaxis of diarrheal disease.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:  
(1) Drug-resistant malaria in Middle East. (2) Treatment and prevention of meningitis. (3) Diagnosis, treatment and control of Relapsing Fever.  
(4) Treatment and prevention of Leishmaniasis. (5) Basic laboratory studies of diseases of the Middle East.

NAME AND LOCATION: U. S. Naval Medical Research Unit No. 4  
U. S. Naval Hospital, Great Lakes, Illinois 60088

COMMAND: Bureau of Medicine and Surgery  
Officer in Charge: Captain R. O. Peckinpaugh, MC USN  
Technical Director: (None)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	.695	.768	.746
Total in-house RDT&E *	.496	.565	.542
Annual operating cost *	.122	.123	.123
Total RDT&E program	.496	.565	.542
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.199	.203	.204
Total annual lab. program	.695	.768	.746

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	33	0	8	23
Civilian	44	1	12	27
Total	77	1	20	50

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
1.9	16,060	6,355	725,380	47,795	.365	.252

MISSION: To conduct basic research into the etiology and transmission modes of acute communicable diseases of the respiratory tract, and to develop and test methods for the control and treatment of those diseases. This unit is located at Great Lakes, Illinois, because of the availability of large numbers of recruits from the eastern portion of the United States.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Evaluation of adenovirus vaccines. (2) Prophylaxis of streptococcal disease and rheumatic fever. (3) Effects of training and environment on recruit respiratory diseases. (4) Evaluation of influenza vaccines. (5) Epidemiology of acute respiratory diseases.

CURRENT IMPORTANT EFFORTS: (1) Evaluation of live adenovirus vaccines. (2) Etiologic agents of acute respiratory disease (ARD). (3) Association of mycoplasma infection with ARD. (4) Immunizing inoculations and acute respiratory disease. (5) Etiology of pneumonia in recruits.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Meningococcal meningitis prevention. (2) Environmental factors in acute respiratory diseases. (3) Field trials of acute respiratory disease vaccines. (4) Etiology of acute respiratory diseases. (5) Host factors in susceptibility to infection.

NAME AND LOCATION: U. S. Navy Toxicology Unit  
 National Naval Medical Center, Bethesda, Maryland 20014  
 COMMAND: Bureau of Medicine and Surgery  
 Officer in Charge: Captain J. Siegel, MSC USN  
 Technical Director: (None)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	.224	.460	.466
Total in-house RDT&E *	.119	.354	.359
Annual operating cost *	.006	.006	.006
Total RDT&E program	.119	.354	.359
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	.105	.106	.107
Total annual lab. program	.224	.460	.466

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	15	0	4	10
Civilian	5	0	2	3
Total	20	0	6	13

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
0.17	964	197	1,870	3,031	.297 .101

MISSION: To provide technical and specialized services in (1) fields of operational toxicology and health engineering relating to toxicity problems aboard ships and (2) the design and use of new weapon systems. To develop and provide biological data needed to prescribe precautionary measures conducive to good health practices. This unit is located at the Naval Medical Center because of available facilities and specialists.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed data on toxicity of FBM (Fleet Ballistic Missile) submarine contaminants. (2) Toxicity studies of triarylphosphate compounds (hydrolic fluids). (3) Evaluated toxicity hazards of FBM-submarine materials and equipment. (4) Evaluated equipment for monitoring carbon monoxide. (5) Developed safe-handling procedures for military chemicals.

CURRENT IMPORTANT EFFORTS: (1) Toxicology support to various systems commands. (2) Toxicity of decomposition products from catalytic burners on submarines. (3) Evaluating toxicity of new chemiluminescents. (4) Evaluating toxicity of new propellants. (5) Behavioral studies in relation to exposure to contaminants.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Support of Underwater Program as it relates to toxicity of contaminants under pressure. (2) Support of chemiluminescent program at Advanced Research Projects Agency. (3) Support of Ships Systems Command for submarine habitability. (4) Support of ASWS (Antisubmarine Warfare Service) in evaluating toxicity of new propellants. (5) Telemetering of physiological data in animals exposed to contaminants.

NAME AND LOCATION: Naval Research Laboratory  
 Washington, D. C. 20390  
 COMMAND: Office of Naval Research  
 Director: Captain Thomas B. Owen, USN  
 Director of Research: Dr. Robert M. Page

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	73.595	77.476	80.539
Total in-house RDT&E *	59.985	63.725	68.489
Annual operating cost*	12.095	12.418	12.790
Total RDT&E program	62.617	64.225	68.989
Total procurement program	8.067	6.900	6.000
Total O&M program	0.791	0.302	0.300
Total other programs	4.752	6.549	5.750
Total annual lab. program	76.227	77.976	81.039

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	104	1	2	106
Civilian	3,625	217	1,076	2,259
Total	3,729	218	1,078	2,365

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
2,768	1,785,115	116,575	705,376	2,607,066	51.128

Note: \*Includes main and other sites and Underwater Sound Reference Division.

MISSION: To conduct scientific research and development in the physical sciences and related fields, directed toward new and improved materials, equipment, techniques and systems for the Navy.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) National acceptance of practical method for steel structure fracture-safe design, 1963. (2) Full, duplex ship-shore solid communication by moon relay achieved, 1964. (3) Aircraft-fuel fire-fighting efficiency improved 6- to 12-fold, 1965. (4) New lubrication concept achieved approximately tenfold increase in miniature bearing life, 1965. (5) AN/APX-72 transponder to be procured for tri-service use, 1966.

CURRENT IMPORTANT EFFORTS: (1) Conception and implementation of centralized electronic control. (2) Management of Coupling Program on Corrosion, of Advanced Research Projects Agency. (3) Concept development and R&D for Navy electronic warfare. (4) Leadership of Navy nonacoustic submarine-detection program. (5) Conduct of solar-radiation-monitoring satellite program.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

(1) Electronic warfare--jamming and deception, passive electronic counter-measures. (2) Antisubmarine warfare--underwater acoustics, surface effects of submerged submarines. (3) Command and control--primarily Naval communications technology. (4) Astronautics--satellite technology, upper-atmosphere investigation. (5) Ocean sciences and engineering--chemical oceanography, nuclear techniques, marine biology, deep-ocean technology.

NAME AND LOCATION: U. S. Naval Observatory, Washington, D.C.  
 (An operational activity, not an RDT&E laboratory.)  
 COMMAND: Chief of Naval Operations  
 Superintendent in Command: Captain J. M. McDowell  
 Scientific Director: Dr. K. A. Strand

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.438	3.299	4.190
Total in-house RDT&E*	0.531	0.644	0.634
Annual operating cost*	1.907	2.655	3.556
Total RDT&E program	0.622	0.711	0.725
Total procurement program	0.239	0.690	1.183
Total O&M program	1.293	1.565	1.973
Total other programs	0.375	0.400	0.400
Total annual lab. program	2.529	3.366	4.281

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	4	0	0	4
Civilian	192	10	101	81
Total	196	10	101	85

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
308.19	64,194	12,188	/34,673/	111,055	4.021

MISSION: To make such observations of celestial bodies, natural and artificial, derive and publish such data as will afford to United States Naval vessels and aircraft, as well as to all availing themselves thereof, means for safe navigation, including the provision of accurate time; and while pursuing this primary function, contribute material to the general advancement of navigation and astronomy.

PAST SIGNIFICANT ACCOMPLISHMENTS: Logistic support to Navy, DoD and the nation by almanacs and ephemerides of predicted positions of stars and planets and accurate time. Was single-service manager to DoD for time and time interval. Established service to synchronize time within DoD to 0.1 microsecond by portable cesium beam clocks. Conducted programs to improve star positions and research in support of mission. Constructed 61-inch telescope for study of faint objects.

CURRENT IMPORTANT EFFORTS: Continuing and improving programs listed above. Establishing an observing site for 7-inch transit circle at El Leoncito, Argentina, to improve southern reference stars and fundamental celestial coordinate system. Installing an IBM 360/40 computer system to increase capability to process star-position data.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue logistic support to operating forces by improvements in almanacs, accurate time and star positions to meet more stringent requirements imposed by advanced technology. Procure modern 9-inch transit circle, utilizing advanced technology to replace outmoded observing instrument. New instrument to be installed at Flagstaff Station to improve star positions and fundamental celestial coordinate system.

NAME AND LOCATION: U. S. Naval Civil Engineering Laboratory  
 Point Hueneme, California  
 COMMAND: Chief of Naval Material  
 Commanding Officer and Director: Captain L. N. Saunders, USN  
 Technical Director: W. F. Burkart

PROGRAM DATA BY FISCAL YEAR (in \$ millions) \*

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	6.682	6.149	6.258
Total in-house RDT&E*	6.000	5.826	5.900
Annual operating cost*	1.417	1.449	1.555
Total RDT&E program	6.000	5.826	5.900
Total procurement program	0.008	0.008	0.008
Total O&M program	0.260	0.235	0.250
Total other programs	0.414	0.080	0.100
Total annual lab. program	6.682	6.149	6.258

Note: \*Included in the totals.

ANOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	5	0	3	0
Civilian	344	19	144	185
Total	349	19	147	185

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
23.46	142,021	21,977	62,263*	216,261*	1.836	2.193

Note: \*Includes 45,992 square feet of space for Construction Battalion Center.

MISSION: Conduct research and development; and test and evaluate techniques, equipment, materials, and structures best suited for the construction, maintenance, and operation of shore activities, advanced bases, amphibious operations and deep-ocean engineering.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed 21-foot-wide end-to-end connected NL (Navy-lightered) causeway. Bottom-laid and floating 5,000-foot amphibious assault ship-to-shore fuel lines. Techniques for constructing compacted snow runways for 135,000-pound wheeled aircraft in Antarctic. Power-transient simulator, 7.5 kva. Information on behavior of materials in deep-ocean environments, based on examination of 11,000 exposed specimens.

CURRENT IMPORTANT EFFORTS: Develop capability for constructing manned habitat in 1,000 feet of water by FY 1970. Conduct nondestructive tests for rapid evaluation of airfield pavements. Develop procedures for using 3-layered pavement design methods. Develop proved design of all-welded, electromagnetically shielded enclosure with acoustical liners meeting requirements of National Security Agency. Establish power characteristics for sensitive electronic power-supply units.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Develop ocean-bottom construction technology for unlimited support by FY 1977; improved equipment and techniques to support construction of advanced bases; means for rapidly installing ports and airfields at advanced bases. Continue efforts toward economies and improving operating capabilities of shore establishment. Develop artificial ice islands as operating platforms in the arctic.

NAME AND LOCATION: U. S. Naval Personnel Research Activity (tenant)

San Diego, California

COMMAND: Bureau of Naval Personnel

Commanding Officer: Commander George W. Watson, USN

Technical Director: Dr. E. Dudek

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.032	1.151	1.506
Total in-house RDT&E *	1.032	1.151	1.506
Annual operating cost *	0.382	0.425	0.558
Total RDT&E program	1.414	1.576	2.064
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	0.227	0.193	0.193
Total annual lab. program	1.641	1.769	2.257

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	32	0	7	29
Civilian	126	24	85	37
Total	158	24	92	66

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
3	21,225	2,540	/21,435	45,200	.162	.142

MISSION: To plan and conduct research and development in personnel operations and behavioral sciences to develop new concepts and improved methods for acquiring, classifying, training, distributing and retaining personnel and for maximizing the utilization of Navy manpower resources.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Identification and analysis of variables related to enlisted retention. (2) Development of improved Basic Test Battery. (3) Development of more efficient curriculum for ET (electronic-technician) training. (4) Impact of automation and microelectronics on personnel and training. (5) Guidebook on the development and use of operational sequence analyses.

CURRENT IMPORTANT EFFORTS: Development of (1) a personnel-assignment model; (2) concepts and methods for improved personnel rotation; (3) centralized, computerized system of recruit assignment; and (4) cost-effectiveness man/machine function allocation formula. (5) Determination of personnel requirements for antisubmarine-warfare command and control system.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

- (1) Development of measures of organizational effectiveness.
- (2) Improved enlisted performance-evaluation system.
- (3) Improved advancement-in-rating system.
- (4) Personnel information-storage and -retrieval system.
- (5) System effectiveness personnel parameter and measures.

NAME AND LOCATION: U. S. Naval Personnel Program Support Activity  
 (tenant, Naval Station), Washington, D.C.

COMMAND: Bureau of Naval Personnel

Commanding Officer: C. O. Williamson

Technical Director: Dr. George G. Burgess

PROGRAM DATA BY FISCAL YEAR (in \$ millions),

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.109	2.453	2.831
Total in-house RDT&E *	1.698	1.994	2.362
Annual operating cost *	0.300	0.320	0.350
Total RDT&E program	1.698	1.994	2.362
Total procurement program	-	-	-
Total O&M program	0.253	0.289	0.289
Total other programs	0.259	0.273	0.283
Total annual lab. program	2.210	2.556	2.934

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	16	-	-	-
Civilian	191	5	122	45
Total	207	5	122	45

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
3	12,872	1,510	3,328	17,710	.089 .019

MISSION: To plan and conduct applied research and exploratory development in personnel operations and related behavioral sciences for the purpose of investigating and developing new concepts and improved methods, techniques and procedures for the administration and management of personnel in order to enhance the utilization of available manpower resources and to exploit the full potential of the Navy man-machine system.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) Developed improved methods for computing officer and enlisted personnel costs. (2) Developed "qualifications" and "training patterns" for Reserve Officers. (3) Evaluated 3-year enlisted program. (4) Computerized Advance Personnel Requirements and Inventory System. (5) Provided human-factors support.

CURRENT IMPORTANT EFFORTS: Development of (1) Qualitative/quantitative manpower requirements for shipboard functions; (2) improved Navy billet evaluation systems; and (3) officer personnel system for the total career life cycle. (4) Evaluation of Navy's use of lower-mental-level personnel. (5) Provide human-factors support for 63 major new weapon systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS:

Development of (1) an improved Officer Personnel System useful in the next decade; (2) a personnel readiness index for use by forces afloat; and (3) a Navy military manpower-management system. (4) Provide human-factors support for 85 new systems. (5) Evaluate standards for enlisted and officer separation.

NAME AND LOCATION: U. S. Naval Supply Research and Development Facility  
Bayonne, New Jersey

COMMAND: Naval Supply Systems Command

Commanding Officer: Captain C. E. Fulton

Technical Director: (none)

PROGRAM DATA BY FISCAL YEAR (in \$ millions) /

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.842	1.619	1.036
Total in-house R&D&E*	1.477	1.254	0.671
Annual operating cost*			
Total RDT&E program	1.527	1.254	0.671
Total procurement program			
Total O&M program	0.365	0.365	0.365
Total other programs			
Total annual lab. program	1.892	1.619	1.036

Note: \*Included in the totals.

/NOA, except for Annual Operating Cost.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	8	0	3	4
Civilian	181	2	83	45
Total	189	2	86	49

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
6	44	24	100	168	0	1.000

MISSION: To conduct research, development, test and evaluation, and related technical functions, as assigned by the Commander, Naval Supply Systems Command, for the Navy and other Government agencies in the field of logistics.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1) CASEX. (2) Keypunch development. (3) Vertical replenishment at sea. (4) Inventory decision rules. (5) Biological- and chemical-warfare work and combat clothing.

CURRENT IMPORTANT EFFORTS: (1) Study of off-loading from MSTS (Military Sea Transportation Service) by helicopter. (2) Buoyant body armor. (3) Physical inventory procedures at Navy stock points. (4) Technological forecasting. (5) Improved methods for material support of aircraft carriers.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Its responsibilities will be consolidated with other laboratories in the near future.

DEPARTMENT OF THE AIR FORCE

NAME AND LOCATION: Rome Air Development Center  
 Griffiss Air Force Base, New York

COMMAND: Research and Technology Division, Air Force Systems Command

Commander: Brig. General A. T. Culbertson

Chief Scientist: Dr. J. S. Burgess

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	15,521	16,297	17,112
Total in-house RDT&E *	15,113	15,869	16,662
Annual operating cost*	3,496	3,671	3,855
Total RDT&E program	81,504	85,578	89,857
Total procurement program	43,546	45,713	47,999
Total O&M program	4,602	4,832	5,073
Total other programs	25,931	27,171	28,377
Total annual lab. program	155,583	163,294	171,306

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	328	3	115	207
Civilian	1293	12	526	765
Total	1621	15	641	972

SPACE AND PROPERTY

Acres	*Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
1,946	546,078	92,402	/130,000/	768,480	19.271	76.314

Note: \*Includes off-base space as follows: 1,906 acres test sites; 127,584 square feet laboratory; 127,584 square feet building.

MISSION: To establish, maintain, and aid in the exploitation of an adequate technological base in the areas of: transmission and reception (below 15 Gc); information processing, display, reliability and compatibility, ground-based surveillance, ground communications, and intelligence. Provides exploratory and advanced development and technical support for the acquisition of operational hardware by Systems Divisions and others.

PAST SIGNIFICANT ACCOMPLISHMENTS: Technical support for acquisition of 416L and M systems, including: frequency-diversity (FD) radars; 474L (BMEWS--ballistic missile early warning system); 496L (space track), including AN/FPS-85 radar; 465L (ELINT--electronic intelligence); 465L (strategic command and control); Bamboo Tree; FYQ-9 data-processing and -display system for Alaskan Air Command; 490L DCS (defense communications system) switches; 425L NORAD COC (combat operations center); and 440L system.

CURRENT IMPORTANT EFFORTS: Over and above an exploratory-development program encompassing 29 projects and some \$43 million is included the development of: man-pack radar; man-pack microwave communications set; combat control team transceivers; signal-processing test facility; ASFIR (active swept-frequency interferometer radar); AIMS; 407L TACS (tactical air control system); and large hydrostatic radar bearings.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continuing support to Southeast Asia and other limited-war problems; techniques for detecting submarine-launched ballistic missiles; phased laser array radar; lightweight 3-D radar; base-line radar; adaptive data MODEMS; reconnaissance exploitation; base security surveillance techniques and equipment; and expanding exploratory-development program in these areas.

NAME AND LOCATION: Air Force Aeropropulsion Laboratory  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Director: Colonel R. T. Hemsley  
 Chief Scientist: Mr. W. Worth

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.819	2.575	2.525
Total in-house RDT&E *	1.819	2.575	2.525
Annual operating cost*	-	-	-
Total RDT&E program	94.392	73.555	94.736
Total procurement program	-	-	-
Total O&M program	0	0	0
Total other programs	0.018	0.021	0.020
Total annual lab. program	94.410	73.576	94.756

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	61	1	57	0
Civilian	329	5	174	170
Total	390	6	231	170

SPACE AND PROPERTY

Space (square feet)					Cost (in \$ millions)	
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
43	412,600	70,400	1220,700	703,700	13.162	29.380

MISSION: Plan, formulate, present and execute exploratory and advanced development programs in air-breathing, electric and advanced propulsion; fuels and lubricants; flight-vehicle power; site support; and associated areas. Ensure the rapid application of research and technology to advanced systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: This information is CLASSIFIED.

CURRENT IMPORTANT EFFORTS: This information is CLASSIFIED.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will perform exploratory and advanced development on turbine, ramjet, SCRAMJET and other air-breathing engines; electric and advanced propulsion, fuels and lubricants; flight-vehicle power; site support; and associated areas. Will apply propulsion research and technology to advanced systems.

NAME AND LOCATION: Air Force Avionics Laboratory  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Research & Technology Division, Air Force Systems Command  
 Director: Mr. P. R. Murry  
 Chief Scientist: Mr. R. J. Nordlund

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.585	4.100	4.500
Total in-house RDT&E*	3.585	4.100	4.500
Annual operating cost*	-	-	-
Total RDT&E program	67.044	65.240	88.917
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	5.699	5.807	5.850
Total annual lab. program	72.743	71.047	94.767

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	82	2	60	15
Civilian	452	8	290	150
Total	534	10	350	165

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
278	202,757	5,304	/173,377/	381,438	9.758

MISSION: Performs exploratory and advanced development programs in the electromagnetic areas of transmission and reception (above 15 Gc), molecular electronics, bionics, lasers, vehicle environment, photographic materials and optronics, position- and motion-sensing devices, navigation, guidance and vehicle defense, reconnaissance and avionics communications, and electromagnetic warfare.

PAST SIGNIFICANT ACCOMPLISHMENTS: Development of new fundamental areas of technology, such as inertial guidance and molecular electronics; development of high-resolution synthetic aperture radar techniques; design and analysis of electronic countermeasures for vehicle defense against specific threats, such as surface-to-air missiles; development of low-altitude, high-speed, high-resolution photographic equipment.

CURRENT IMPORTANT EFFORTS: Development and application of laser technology. Development of devices and techniques for manned navigation in space. Development of low-light-level and nighttime reconnaissance and weapon strike capability. Development of active jamming and deception devices to reduce vulnerability of aerospace vehicles.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue to develop and exploit new areas of technology for avionics applications. Bionics will lead to better sensing reacting systems and to devices that exhibit artificial intelligence. Improved data on target/signature/sensor measurements for aerospaceborne detection, recognition, acquisition and kill of enemy threats. Improved countermeasures.

NAME AND LOCATION: Air Force Flight Dynamics Laboratory  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Director: Colonel G. T. Buck  
 Chief Scientist: Mr. J. Stalder

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.900	4.000	4.000
Total in-house RDT&E *	3.900	4.000	4.000
Annual operating cost*	-	-	-
Total RDT&E program	30.300	29.800	20.700
Total procurement program	-	-	-
Total O&M program	0	0	0
Total other programs	1.500	1.100	1.300
Total annual lab. program	31.800	30.900	22.000

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	97	2	57	40
Civilian	654	12	358	321
Total	751	14	415	361

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
90(E)	545,732	56,614	/24,949/	627,295	22.015	51.648

MISSION: Plan, formulate and execute exploratory and advanced development programs in flight-vehicle dynamics, structures, aerodynamics, aerothermodynamics, performance, control, decelerators, alighting and orbital attachment, etc., including experimental simulation and flight-testing techniques. Serve as focal point for assigned technical areas, and ensure application of research and technology to advanced systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed: Practical adaptive flight-control systems (e.g., in F-111); cloverleaf-type parachute, glide ratio 2, as part of MOL (manned orbital laboratory) and C-5A airdrop system; technique for predicting aerodynamic parameters of high-lift-to-drag-ratio, aerodynamic, maneuvering reentry vehicles; versatile experimental full-scale research capability in acoustic fatigue, bioacoustics and sound transmission.

CURRENT IMPORTANT EFFORTS: Applications in: (1) V/STOL aerodynamics and handling qualities, gust alleviation, mode stabilization, terrain-avoidance flight control; (2) in hypersonic cruise and reentry regime--configuration and performance analysis in rarefied flows, shock-wave interference effects, thermal deformation, energy measurement; (3) high-flotation landing gear for unprepared surfaces, V/STOL technology, aerial delivery and pickup, armor protection, vulnerability reduction.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Operate as focal point for flight dynamics, exploratory and advanced development. Pursue scientific investigation and experimentation in flight- and stability-control systems and instrumentation; dynamic problems in flight vehicles; aerodynamics and flight mechanics; mechanical subsystems for aerospace vehicles, structural design criteria and methods analysis; and application of advanced V/STOL technology.

NAME AND LOCATION: Air Force Materials Laboratory  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Director: Colonel L. R. Standifer  
 Chief Scientist: Dr. A. M. Lovelace

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	5.962	6.120	6.317
Total in-house RDT&E *	5.962	6.120	6.317
Annual operating cost*	-	-	-
Total RDT&E program	34.817	32.409	38.836
Total procurement program	20.000	20.000	20.000
Total O&M program	-	-	-
Total other programs	3.688	1.000	1.000
Total annual lab. program	58.505	53.409	59.836

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	59	6	64	1
Civilian	361	14	233	128
Total	420	20	297	129

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
8.6	166,274	67,297	/36,025/	269,596	5,982	8.839

MISSION: Plan and execute exploratory and advanced development in materials; frontier in-house and contract programs; the manufacturing-methods program on processes and fabrication technology. Serve as focal point for competent judgments on materials. Support programs to ensure rapid application of new technology to systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: Titanium as an aerospace metal; numerically controlled machining, manufacturing process for integrated circuits for aircraft and missiles; sealants critical to Mach 3 aircraft; high-temperature resins in reentry heat shields of first ballistic missiles; case materials for MINUTEMAN and solid boosters; adhesives for honeycomb panels for aircraft and missiles.

CURRENT IMPORTANT EFFORTS: Composite materials for airframe, propulsion and reentry-vehicle components; titanium, dispersion-strengthened alloys, coated superalloys and refractory materials for high-temperature applications; durable adhesives, coatings, sealants and fluids; hardened ablatives with low observability; advanced electromagnetic materials and processes.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Lead laboratory for development of new structural, environment-resistant, seal/sealant, electromagnetic and energy-transfer materials and processes, for new propulsion, structural, electronic and other technologies--providing new state of the art for advanced hypersonic, support, space, ballistic, electronic and reentry systems.

NAME AND LOCATION: Air Force Weapons Laboratory  
 Kirtland Air Force Base, New Mexico

COMMAND: Research and Technology Division, Air Force Systems Command

Director: Colonel R. A. House (Acting)

Chief Scientist: Colonel W. C. Beckham

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	6.965	9.173	11.576
Total in-house RDT&E*	6.704	8.812	11.211
Annual operating cost*	0.783	1.144	2.700
Total RDT&E program	26.355	21.753	26.112
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	2.611	2.548	2.600
Total annual lab. program	28.966	24.301	28.712

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	557	22	320	179
Civilian	280	14	81	217
Total	837	36	401	396

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
186	238,100	15,900	137,500	291,500	4.804

MISSION: Plan and execute exploratory and advanced development on kill mechanisms, effects and hazards and delivery techniques for nuclear weapons. Carry out projects for Army, Navy, National Aeronautics and Space Administration, Advanced Research Projects Agency, Defense Atomic Support Agency, Atomic Energy Commission and other Government agencies. Conduct activities in foreign aerospace technology within the scope of its mission.

PAST SIGNIFICANT ACCOMPLISHMENTS: Developed: (1) Techniques for simulating nuclear-weapons effects; (2) technology and techniques for determining vulnerability of USAF systems to nuclear-weapons effects; and (3) hardware, systems analysis and safety aspects relating to nuclear-weapon and reactor-system compatibility. Completed extensive research in nuclear-weapons effects and phenomena.

CURRENT IMPORTANT EFFORTS: Continue appropriate development efforts, extensive research in lasers, and possible application to USAF systems. Develop techniques and devices for simulating nuclear weapons effects; and techniques for assessing survivability/vulnerability of USAF systems to nuclear-weapons effects. Perform extensive development of arming and fuzing systems for nuclear weapons.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue research on military laser applications. Develop additional nuclear-weapons effects simulation techniques. Continue advanced arming and fuzing developments for nuclear weapons. Develop additional techniques for assessing survivability/vulnerability of USAF systems to nuclear-weapons effects.

NAME AND LOCATION: Systems Engineering Group  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Commander: Brig. General G. E. Lundquist  
 Technical Director: Mr. L. E. Charnock

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	29.390	30.590	33.376
Total in-house RDT&E *	29.390	30.590	33.376
Annual operating cost*	+	+	+
Total RDT&E program	36.127	28.855	41.400
Total procurement program	-	-	-
Total O&M program	0	0	0
Total other programs	2.234	2.390	2.452
Total annual lab. program	38.361	31.245	43.852

Note: \*Included in the totals.

†Not available.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	242	3	147	60
Civilian	2,004	3	1,164	898
Total	2,246	6	1,311	958

SPACE AND PROPERTY

Acres	Space (square feet) (E)			Cost (in \$ millions) (E)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
100	119,054	326,228	-	445,282	3,676	9,635

MISSION: Provides systems, subsystems, and equipment engineering/technical direction for programs assigned to Aerospace Systems Division and as directed by higher headquarters. Conducts in-house technical-feasibility studies, engineering analysis, and synthesis of potential aeronautical systems. Directs and manages assigned programs. Provides R&D procurement services.

PAST SIGNIFICANT ACCOMPLISHMENTS: Systems engineering, technical direction on all recent experimental and operational aeronautical systems, e.g., XB-70, C-141. Prepared technical-definition criteria for new programs such as C-5A and AGM-69. Transitioned new technology through advanced development to current systems, e.g., new, improved tactical-fighter avionics technology produced by Mk II program to update F-111.

CURRENT IMPORTANT EFFORTS: Providing systems engineering and technical direction for more than 50 active aeronautical systems. Major efforts include engineering for the C-5A, AMSA (advanced manned strategic aircraft), AGM-69, F/RF-111, F/RF-4C,D,E, and C-141. In addition, eight advanced development programs to apply new technology to systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will continue to provide systems engineering for an increasing number of aeronautical and missile systems; a continuing increase in the requirement to support special limited-war and Southeast Asia efforts is anticipated.

NAML AND LOCATION: Air Force Armament Laboratory  
 Eglin Air Force Base, Florida  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Director: Colonel W. P. Glover

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	2.500	3.200	3.500
Total in-house RDT&E *	2.500	3.200	3.500
Annual operating cost *	1.200	1.400	1.600
Total RDT&E program	58.238	46.270	47.165
Total procurement program	17.692	25.000	25.000
Total O&M program	-	-	-
Total other programs	1.662	2.200	2.200
Total annual lab. program	77.592	73.470	74.365

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	161	2	117	32
Civilian	238	4	130	98
Total	399	6	247	130

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
20	50,995	12,749	17,160	70.904	1.992

MISSION: Performs exploratory and advanced development on nonnuclear and CB munitions and weapons, targets and scorers; and in those technologies associated with armament effectiveness, including air-launched missiles and fire-control and weapons-delivery subsystems.

PAST SIGNIFICANT ACCOMPLISHMENTS: Recently introduced line items include: Dispensers--SUU-24/A for B-52 aircraft, CBU-14, A/A 45Y-1 internal defoliant; bombs--BLU-3B, 24/B and 26/B; retarder for M117 bomb; FMU-35/B fuze; WDU-4/A flechette warhead; MXU-470/A machine-gun module; gun pods--SUU-11A/A and 23/A; CBU-19A riot-control cluster; munition-handling equipment; ballistic tables for conventional and nuclear munitions.

CURRENT IMPORTANT EFFORTS: MLU-43/B air-delivered, MLU-42/B wide-area antipersonnel mines; FMU-56/B, 57/B and 54/B fuzes; SAC flame weapons; BLU-33/B, 34/B and laser-guided bombs; aircraft machine-gun module; SUU-31/B and B-52 modular-bomb dispensers; ballistic tables; weapons analysis, cost-effectiveness studies; battlefield illumination; target-marking, bridge and hard-structure and CW screening munitions; ambush and airborne ground-fire detectors.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Missile all-weather acquisition/guidance; standoff cluster missiles. Direct-hit munitions with low CEP. Psychological, improved biological-chemical weapons, and air-delivered ground-control weapons. Advanced warheads and dispensers. Fuel-air explosives. Tactical night capabilities. Supersonic carriage. New gun concepts. Aircraft/munition system studies. Conventional weapons and target vehicles for space applications.

NAME AND LOCATION: Air Force Rocket Propulsion Laboratory  
 Edwards Air Force Base, California  
 COMMAND: Research and Technology Division, Air Force Systems Command  
 Director: Colonel E. M. Douthett

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	10.634	10.451	10.782
Total in-house RDT&E*	10.034	10.151	10.782
Annual operating cost *	0.145	0.190	0.210
Total RDT&E program	49.706	48.920	59.900
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	8.201	6.189	3.504
Total annual lab. program	57.907	55.109	63.404

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	333	3	109	208
Civilian	459	7	126	317
Total	792	10	235	525

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
53,120	482,113		41,812	/145,526/ 669,451	69,060	35.0

MISSION: Plan, formulate, present and execute exploratory and advanced development programs in the areas of rocket propulsion, components, systems, propellants and associated ground equipment. Conduct in-house research in areas in which the laboratory excels. Maintain a high degree of technical competence in those areas.

PAST SIGNIFICANT ACCOMPLISHMENTS: Rockets--large, segmented (TITAN IIIC); attitude-control (X-15, AGENA); pulse solid and prepackaged liquids (SRAM--short-range attack missile). Nozzles--submerged movable; ablative for large solids. Propellants--advanced solid; specifications for liquid rockets; for FALCON, GENIE. Technology--hazards, Eastern and Western Test Ranges; liquid-hydrogen (CENTAUR JII). Fiberglass chambers (MINUTEMAN/POI ARIS); main time tank injection.

CURRENT IMPORTANT EFFORTS: Technology--storable-rocket for space launch vehicles, ballistic missiles; cryogenic-rocket for recoverable, reusable space vehicles. Maneuvering propulsion for reconnaissance (evasion, coorbital interceptor spacecraft). Rockets--air-augmented for air-launched missiles; advanced, ultra-energy; restartable, thrust-controllable; prepackaged liquid; small attitude/orbit-control; fluorine-hydrazine chambers, subsystem components.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will function as lead laboratory in exploratory and advanced development on rocket-propulsion technology, solid- and liquid-propellant rockets, hybrid rocket propellants and components, and nuclear and advanced rockets. Will support Systems Divisions in weapon-system studies of rocket propulsion.

NAME AND LOCATION: Arctic Aeromedical Laboratory  
 Fort Wainwright, Alaska  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Colonel E. R. Galbraith, Jr.

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program *	0.495	0.500	0.500
Total in-house RDT&E *	0.495	0.500	0.500
Annual operating cost *	0.194	0.182	0.180
Total RDT&E program	0.797	0.790	0.790
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	0.195	0.201	0.205
Total annual lab. program	0.992	0.991	0.995

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	27	1	7	18
Civilian	24	-	9	11
Total	51	1	16	29

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
10	19,124	2,218	13,865	35,207	1.595	0.506

MISSION: Determine current needs, forecast future requirements, and conduct human-factors research and development in the arctic environment.

PAST SIGNIFICANT ACCOMPLISHMENTS: Made contributions in areas of clothing, rations, personal equipment, operating procedures, and training programs for use in the arctic. Developed new arctic survival equipment, such as walk-around sleeping bags and shelters. In 1965, established the feasibility of operating combined high-altitude, cold-environment station at 14,000 feet on the summit of Mt. Wrangell, Alaska.

CURRENT IMPORTANT EFFORTS: Physiological research--the immediate effect of acute cold exposure, acclimatization to cold and other arctic stresses, and physiological effects of reduced general body temperatures, i.e., hypothermia and hibernation. Biochemistry research and the biochemical basis for harmful effects of cold. Environmental protection research--new concepts of arctic survival gear, e.g., survival shelters, exposure suits, life rafts.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Research in arctic biology to acquire new knowledge of the interaction between man and the arctic environment. Develop improved methods of protecting Air Force personnel against the arctic environment. Determine material requisites for aircrew effectiveness in the arctic. Resolve problems concerning cold-weather clothing, protective and survival equipment, survival techniques and arctic nutrition.

NAME AND LOCATION: Air Force Epidemiological Laboratory  
 Lackland Air Force Base, Texas  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Lt. Colonel E. V. Dahl

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.256	0.269	0.344
Total in-house RDT&E *	0.256	0.269	0.344
Annual operating cost *	0.138	0.131	0.124
Total RDT&E program	0.256	0.269	0.344
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	0.270	0.290	0.308
Total annual lab. program	0.526	0.559	0.652

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	42	4	12	25
Civilian	13	1	4	14
Total	55	5	16	39

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
2.8	18,964	791	3,048	22,803	0.660      0.438

MISSION: Research in infectious diseases, disease vectors, microbiology, laboratory medicine, forensic toxicology. Investigate disease outbreaks. Provide reference and consultant laboratory services in bacteriology, medical entomology, parasitology, serology, virology, clinical chemistry and forensic toxicology.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1963-1966) Demonstrated that newly imported primates carry infectious hepatitis. Isolated and characterized bacteriophages active against bacterial tribe Mimeae. Demonstrated arboviruses that infect humans in common saltmarsh mosquitoes. Developed new, specific laboratory methods for determining ethchlorvynol, diphenylhydantoin, propoxyphene, diphenhydramine, ethanol and ephedrine.

CURRENT IMPORTANT EFFORTS: Monitor infectious diseases in Air Force personnel and make timely control recommendations. Provide reference and consultant laboratory services in clinical laboratory disciplines. Define factors in the epidemiology of meningococcal meningitis and American trypanosomiasis. Characterize enteric inhibitors of enteroviruses. Develop rapid, specific methods for detecting and quantitatively determining adrenal steroids and amitriptyline.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will function as lead laboratory for research and development on diagnostic and control methods relating to infectious diseases that affect operations.

NAME AND LOCATION: 6571st Aeromedical Research Laboratory  
 Holloman Air Force Base, New Mexico  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Lt. Colonel C. H. Kratochvil  
 Chief Scientist: Dr. H. J. Von Beckh

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.757	0.737	0.750
Total in-house RDT&E*	0.577	0.397	0.425
Annual operating cost*	0.867	1.040	1.200
Total RDT&E program	1.656	1.793	1.985
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	0.180	0.340	0.325
Total annual lab. program	1.836	2.133	2.310

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	63	10	19	52
Civilian	27	3	5	26
Total	90	13	24	78

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
45	61,223	7,200	1,306,789	1,375,212	2.337

MISSION: To function as a limited national primate facility. To conduct and sponsor comparative aerospace medical research and development, with special emphasis on the chimpanzee as surrogate for, or precursor to, man in high-risk or unusual environments. To conduct a program in the neurosciences and experimental medicine with likely potential for military applications.

PAST SIGNIFICANT ACCOMPLISHMENTS: Effects of decelerative forces on man and animals, on the central nervous system (CNS) and toxic hazards effects on CNS for entire DoD, 1961-66. Rapid decompression of chimpanzees to near vacuum, 1964-66. Comprehensive and unexcelled psychophysiological data on the chimpanzee, 1958-66.

CURRENT IMPORTANT EFFORTS: Increase large-primate support to services, Federal Aviation Agency, Defense Atomic Support Agency, NASA and Food and Drug Administration, e.g., visual effects of simulated nuclear explosions. Evaluate toxic hazards and classified chemical agents at altitude. Effects of ionizing and coherent radiation. Longer duration exposure to near-vacuum after decompression. Continue programs in neurophysiology and experimental medicine.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Rapid-decompression experiments with chimpanzees, using 2-gas mixture chosen for MGL. Behavioral effects of simulated nuclear events. Research on coherent, microwave and ionizing radiation. Effects of classified chemical agents on performance at altitude; of abrupt deceleration on humans; of prolonged low-level deceleration on chimpanzees; of blast. Increased pressure environments.

NAME AND LOCATION: 6570th Personnel Research Laboratory  
 Lackland Air Force Base, Texas  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Colonel J. H. Ritter  
 Technical Director:

**PROGRAM DATA BY FISCAL YEAR (in \$ millions)**

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1.316	1.612	1.612
Total in-house RDT&E *	1.216	1.510	1.510
Annual operating cost *	0.100	0.103	0.103
Total RDT&E program	1.751	2.047	2.052
Total procurement program	-	-	-
Total O&M program	1.316	1.612	1.612
Total other programs	0.442	0.462	0.462
Total annual lab. program	2.193	2.509	2.514

Note: \*Included in the totals.

**PERSONNEL DATA--END OF PRIOR FISCAL YEAR**

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	85	1	14	64
Civilian	130	25	39	95
Total	215	26	53	159

**SPACE AND PROPERTY**

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
7	45,054	2,600	2,235	49,889	.530

MISSION: Conduct R&D in the area of Air Force personnel system; develop procedures and concepts concerned with obtaining, classifying, assigning, using, evaluating, promoting, retaining and separating Air Force personnel. Develop personnel-system simulation models. Provide an operations-research capability in personnel management.

PAST SIGNIFICANT ACCOMPLISHMENTS: Made study on officer grade requirements which established appropriate grade levels for all Air Force line officers. Conducted research in human reliability which led to a capability for early screening of airmen in high-risk jobs. Developed force-trend reports for use in USAF compensation studies. Evaluated AFROTC unit productivity in terms of quality and retention.

CURRENT IMPORTANT EFFORTS: Research on: techniques for evaluating personnel on the job in terms, tasks and duties of the job and specialty; the utility of background investigation, personnel retention, promotion, effectiveness measurements, and other facets of personnel measurements. Development of mathematical simulation of the Air Force personnel system.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will function in all areas of personnel research on the management of the force, including the development of force-simulation models as tools for personnel management. Will undertake studies to expand these efforts to incorporate economic factors so that cost-effective solutions to management problems may be more easily obtained.

NAME AND LOCATION: School of Aviation Medicine  
 Brooks Air Force Base, Texas  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Colonel J. B. Nuttall  
 Chief Scientist: Dr. H. G. Clamann

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	6.674	7.151	7.633
Total in-house RDT&E *	6.572	7.044	7.521
Annual operating cost*	-	-	-
Total RDT&E program	9.847	11.308	12.568
Total procurement program	-	-	-
Total O&M program	0.102	0.107	0.112
Total other programs	4.289	5.323	5.323
Total annual lab. program	14.238	16.738	18.003

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	666	91	148	438
Civilian	451	58	154	306
Total	1,117	149	302	744

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	
41	153,052	57,292	1431,152/	641,496	15.578	14,576

MISSION: Conducts R&D programs in life support, aerospace medicine and radiobiology. Provides medical evaluation and consultation services for rated personnel with medical problems affecting their flying status. Conducts graduate and continuing education programs in clinical medicine, aerospace medicine and related fields.

PAST SIGNIFICANT ACCOMPLISHMENTS: Definition of certain physiological effects of radiation, simulated weightlessness and altered atmospheric pressures. Establishment of safe physical standards for space-cabin atmospheres. Revised cardiovascular physical standards for rated personnel. Performed medical selection of NASA and USAF space pilots. Developed in-flight physiological monitoring system. Developed portable dental field units.

CURRENT IMPORTANT EFFORTS: Determination of nutritional requirements for space flight. Development of method for rapid identification of pathogenic bacteria and virus. Development of an aeromedical-evacuation patient-care system. Development of an operational flashblindness-protection system.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Engineering development of an air-transportable hospital. Development of selected items of medical equipment and automated physical examination system. Determination of radiation effects on primate performance. Determination of the effects of aging on fliers.

NAME AND LOCATION: 6570th Aerospace Medical Research Laboratory  
 Wright-Patterson Air Force Base, Ohio  
 COMMAND: Aerospace Medical Division, Air Force Systems Command  
 Director: Colonel R. A. Yerg  
 Technical Advisor: Dr. F. W. Berner

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	3.385	3.600	3.600
Total in-house RDT&E *	3.385	3.600	3.600
Annual operating cost*	-	-	-
Total RDT&E program	10.752	10.649	12.264
Total procurement program	-	-	-
Total O&M program	-	-	-
Total other programs	2.020	2.020	2.020
Total annual lab. program	12.772	12.669	14.284

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	140	16	55	80
Civilian	229	25	111	121
Total	369	41	166	201

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
16	226,494	21,160	0	247,654	8.919	14.484

MISSION: Research in biodynamics, toxicology, life support, aerospace medicine, environmental medicine, biotechnology, bionics, human engineering and training. Determine human characteristics related to performance of operator, maintenance and other support personnel. Establish design criteria to protect and sustain evaluative devices, systems, material for Air Force systems.

PAST SIGNIFICANT ACCOMPLISHMENTS: Development of: Life-support-system evaluator, cardiopulmonary laboratory, personal telemetry unit, dynamic escape simulator, toxic-hazards facility, two-light systems, cineradiograph, AF-NATO anthropometric data, new training techniques, biothermal analog computer, neural network simulator. Sonic-boom research; zero-g studies; tolerance and impact vibration; visual capabilities in space.

CURRENT IMPORTANT EFFORTS: Development of: Hydrazine dosimeter, predictor displays, counterinsurgency training techniques, oxygen-consumption technique. Automation of human-factors data; center-of-gravity shift in escape; D17 experiment for solid electrolyte CO<sub>2</sub>; toxic hazards; cardiopulmonary physiology; biomechanics; Joint Task Force II support.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will function as lead laboratory for R&D biodynamics; biomechanics; environmental stress in aerospace environments; human engineering and training research for aerospace vehicles; toxicological studies of space-cabin materials, propellants and protective devices; life-support research of cabin environments and altitude-protective devices.

NAME AND LOCATION: Air Force Flight Test Center  
 Edwards Air Force Base, California  
 COMMAND: Air Force Systems Command  
 Commander: Brig. General H. B. Manson

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	37,235	37,812	41,615
Total in-house RDT&E *	30,288	29,632	35,285
Annual operating cost*	15,522	15,304	15,500
Total RDT&E program	32,635	32,000	37,700
Total procurement program			-
Total O&M program	0,744	0,718	0,750
Total other programs	6,947	8,180	6,330
Total annual lab. program	40,326	40,898	44,780

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	3,286	2	238	2,952
Civilian	2,152	2	143	1,994
Total	5,438	4	381	4,946

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total built	Real property
300,722/ 739,851	486,752	/ 2,491,246/ 3,711		9	73,045 46,500

MISSION: Conduct and support tests of manned aircraft systems. Conduct flight evaluation and recovery of designated aerospace research vehicles and development testing of aerodynamic decelerators. Operate the USAF Aerospace Research Pilot School.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1961-1966) Aerospace Research Pilot School introduced space training into its curriculum. High-speed, high-altitude rocket research with X-15 aircraft, Mach 6.06, 354,000 feet. C-141 test aircraft flown 2500 hours in 11 months. E1 Centro Test Unit parachute-dropped APOLLO test module from modified C-133 with successful recovery.

CURRENT IMPORTANT EFFORTS: Joint Task Force conducting categories I and II tests of F-111 and RF-111 aircraft; development testing of SR-71 and YF-12 aircraft; flight-dynamics research using XB-70 Mach-3 cruise aircraft and lifting-body vehicles. Flight-testing of V/STOL aircraft, XC-142 and P-1127. Continued tests of GPES/LAPES (general-purpose/low-altitude personnel extraction systems) and recovery-systems tests for GEMINI, F-111, F-106 and APOLLO programs.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will function as flight-test center for the V/STOL, counterinsurgency, tactical and airlift forces family of aircraft. Future systems (such as C-5A, A-7, C-142, OV-10A, FB-111) are programmed for testing at the Center. Other future programs include AMSA (advanced manned strategic aircraft), SST (supersonic transport), hypersonic manned vehicles, and lifting-body vehicles.

NAME AND LOCATION: Air Force Special Weapons Center  
 Kirtland Air Force Base, New Mexico  
 COMMAND: Air Force Systems Command  
 Commander: Colonel R. S. Garman  
 Technical Advisor: Mr. D. E. Chadwick

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	21,141	20,213	19,607
Total in-house RDT&E*	20,751	19,252	18,637
Annual operating cost*	11,368	11,464	12,385
Total RDT&E program	36,935	28,098	30,096
Total procurement program	-	-	-
Total O&M program	0.001	0.295	0.302
Total other programs	10,992	10,596	10,278
Total annual lab. program	47,928	38,979	40,676

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	1,728	-	59	1,624
Civilian	1,211	1	52	1,268
Total	2,939	1	111	2,892

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
2,321	195,282	252,700	/2,613,919/	3,061,901	23,319	24,419

MISSION: Conduct tests of nuclear systems, including AEC weapon developments, weapon compatibility, support equipment, and nuclear-effects simulation. Plan for, maintain and demonstrate capability to support resumed nuclear testing. Provide air support for underground nuclear tests. Operate and maintain Kirtland Air Force Base and support 37 tenant organizations.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1963-1965) Conducted shock-simulation tests on MINUTEMAN shock isolation systems. Developed capability to rapidly support atmospheric nuclear testing with airborne array (three NC-135 and two B-52 aircraft). Conducted full-scale EMP (electromagnetic-pulse) vulnerability tests on hardened systems. Developed airborne astrographic camera system (AACs).

CURRENT IMPORTANT EFFORTS: Conducting full-scale high-explosive simulation tests (HEST) on hardened systems to determine vulnerability to air-induced ground shock. Establishing capability to assess vulnerability of operational USAF systems to nuclear-weapons effects.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Conduct effects-simulation tests--i.e., EMP, TREES (transient radiation effects on electronic systems), shock, blast, etc.--of USAF systems and components to determine their vulnerability. Maintain readiness-to-test capability. Test compatibility of nuclear weapons with USAF systems, including drop tests, support, equipment, etc.

NAME AND LOCATION: Air Proving Ground Center  
Eglin Air Force Base, Florida

COMMAND: Air Force Systems Command  
Commander: Major General A. J. Kinney  
Chief Scientist: Mr. T. H. Dalehite

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	50.181	50.207	56.481
Total in-house RDT&E *	46.320	46.422	52.348
Annual operating cost *	19.688	18.971	20.747
Total RDT&E program	55.764	51.442	55.108
Total procurement program	-	-	-
Total J&M program	3.058	2.840	3.188
Total other programs	4.403	4.545	4.545
Total annual lab. program	63.225	58.827	62.841

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	4,932	-	293	4,746
Civilian	2,582	2	264	2,297
Total	7,514	2	557	7,043

SPACE AND PROPERTY

Space (square feet)	Cost (in \$ millions)					
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
464,984 / 103,624	538,694	/ 6,821,682	/ 7,464,000		158.60	154,948

MISSION: Conducts and supports weapons-effectiveness test and evaluation of nonnuclear munitions, armament systems, electronic command and control systems and biological-, chemical- and electromagnetic-warfare devices, techniques and equipment; climatic-testing-probe operations. Provides and operates drone aircraft; limited-warfare, and special-air-warfare tactics, techniques and equipment. Supports Tactical Air Command joint exercises.

FAST SIGNIFICANT ACCOMPLISHMENTS: Electronic countermeasures for nonnuclear munitions. Test of: B-52 and F-105 weapon systems, anti-surface-to-air missile, quick-reaction capability, penetration aids, HOUND DOG. Support of: Program 482L, Desert Test Center, limited-war activities (TAC). Exercises CAROLINA MOON, INDIANA RIVER, GOLD FIRE, SPARROW SHOOT. Development of CB test capabilities. About 160 yearly probe launches for USAF and other Government activities.

CURRENT IMPORTANT EFFORTS: Test support for Southeast Asia; F-111. Expansion of nonnuclear-ordnance test facility; simulation of air-defense systems; instrumentation for JTF-2. Support of JMEM (Joint Munitions Effectiveness Manual), JEEP (Joint Environmental Effects Program), SEEK EAGLE, SHED LIGHT, SHARP NAIL, Loran-D, AFWET (AF Weapons Effectiveness Testing), 407L (TACS); 35,000 SAWC/TAWC (Special/Tactical Air Warfare Centers) 33rd TAC Wing sorties annually; CB weapons (Dugway); SNOW TIME, UNDER BRUSH (reconnaissance); 200 probe launches annually.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Three principal R&D efforts--electromagnetic warfare, nonnuclear ordnance, command and control--will demand most of the Center's test capability. To support these efforts, the test complex must become more sophisticated. The non-R&D efforts now using large amounts of resources will be deemphasized to meet the expanding R&D requirements.

NAME AND LOCATION: Air Force Missile Development Center  
Holloman Air Force Base, New Mexico

COMMAND:  
Commander: Air Force Systems Command  
Chief Scientist: Brig. General L. A. Kiley

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	23.905	20.439	22,378
Total in-house RDT&E*	22.581	18.986	20.925
Annual operating cost*	13.084	10.548	11.700
Total RDT&E program	34.571	31.328	34.040
Total procurement program	-	-	-
Total O&M program	0.688	0.700	0.700
Total other programs	10.345	10.791	10.791
Total annual lab. program	45.604	42.869	45.531

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	2,204	2	175	1,863
Civilian	1,691	6	183	1,611
Total	3,895	8	363	3,474

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)	
	Laboratory	Administrative	Other	Total building	Real property
97,436	555,993	173,218	/3,031,885/	3,761,096	95.465

MISSION: R&D through evaluation and test for all classes of missile systems, stellar or doppler-aided and pure inertial guidance systems, reentry physics, radar-target scatter, and radar signatures, fuzes, seat-ejection systems, fire-control and reconnaissance-sensor systems. Furnish aircraft and airborne target support to White Sands Missile Range.

PAST SIGNIFICANT ACCOMPLISHMENTS: Inertial-guidance evaluation for MINUTEMAN, ATLAS, TITAN missiles; inertial guidance testing for F4 and F-111 aircraft series. Evaluation of ground and intercept missiles for aircraft; reconnaissance system for RF4C; seat-ejection system for F-100, F-102, F-105, and F-106 aircraft. Completion of "Big Momma" testing for Southeast Asia.

CURRENT IMPORTANT EFFORTS: Support of ATHENA reentry physics program, including radar-data acquisition and reduction. Evaluation of ground and intercept missiles for F4 aircraft. Blast-effect and rain-erosion problems for missiles and fuzes; bomb computers, computing gunsights; new methods of ranging and bomb delivery; evaluation of bomb, gun and missiles.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Evaluation and support of short-range attack missile (SRAM), MAVERICK and advanced air-to-surface missile (679A); RF-111A reconnaissance sensors; terrain-comparison control system; and stellar/doppler-aided inertial system for aircraft and satellite; seat and capsule evaluation for aircraft; rain erosion; blast and impact testing of fuzes. Possible support to TAC Wing.

NAME AND LOCATION: Arnold Engineering Development Center  
 Tullahoma, Tennessee  
 COMMAND: Air Force Systems Command  
 Commander: Brig. General L. D. Gossick

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	59.860	54.475	47.785
Total in-house RDT&E*	59.859	54.474	47.784
Annual operating cost*	9.904	10.052	10.769
Total RDT&E program	65.311	55.974	49.284
Total procurement program	-	-	-
Total O&M program	0.001	0.001	0.001
Total other programs	1.042	1.278	1.278
Total annual lab. program	66.354	57.253	50.563

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	115	3	46	62
Civilian	147	1	40	113
Total	262	4	86	175

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
40,121	1,078,761	198,831	/520,254/	1,797,846	393.101	36.279

MISSION: Support the timely acquisition of superior aerospace systems by conducting RDT&E in aerospace environmental facilities for the Air Force, other Government agencies, and industry.

PAST SIGNIFICANT ACCOMPLISHMENTS: Provided environmental test support essential to successful development of (1) missiles--ATLAS, TITAN I and II, MINUTEMAN, POLARIS, NIKE-X, PERSHING; (2) aircraft--B-52, B-58, B-70, X-15, F-104; (3) space boosters--ATLAS-AGENA, TITAN III, SATURN; (4) space systems--MERCURY, GEMINI, APOLLO, RANGER AND SURVEYOR.

CURRENT IMPORTANT EFFORTS: Providing vital environmental test support required for successful, timely development of: F-111, C-5A, TITAN III-MOL, advanced manned strategic aircraft, POSEIDON, advanced MINUTEMAN, SATURN, APOLLO, SRAM, advanced ballistic reentry systems, and items for Southeast Asia. Also making studies leading to design of hypersonic and V/STOL wind tunnels.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will provide environmental test support for future military systems such as advanced ballistic missile, advanced manned strategic aircraft, advanced ballistic reentry systems, manned orbital laboratory, low-altitude supersonic vehicle, V/STOL fighter and assault transport, etc.; and will construct advanced test facilities to give essential support to advanced military systems.

NAME AND LOCATION: Air Force Eastern Test Range  
 Patrick Air Force Base, Florida  
 COMMAND: National Range Division, Air Force Systems Command  
 Commander: Major General V. G. Huston

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	226.557	220.427	234.160
Total in-house RDT&E *	211.058	204.589	217.970
Annual operating cost*	45.390	57.350	59.026
Total RDT&E program	211.058	204.589	217.970
Total procurement program	-	-	-
Total O&M program	0.965	1.170	1.190
Total other programs	14.534	14.688	15.000
Total annual lab. program	226.557	220.447	234.160

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	2,030	4	207	1,927
Civilian	2,430	2	131	2,433
Total	4,460	6	338	4,360

SPACE AND PROPERTY

Space (square feet)	Cost (in \$ millions)					
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
28.921	2,670.144	781.168	/5,640,236/	9,091,548	334.700	941.000

MISSION: Provides range and launch support services for assigned missiles and manned and unmanned aerospace programs. Collects, processes and delivers trajectory-measurement, telemetry, command/control and optical data in acceptable format. Provides on-orbit support for other ranges' launches. Maintains range safety during all test operations. Provides training facilities for tactical groups.

PAST SIGNIFICANT ACCOMPLISHMENTS: Provide test support contributing to successful completion of R&D testing of such programs as TITAN I and II, MINUTEMAN I, POLARIS A-1, PERSHING, SATURN I, MERCURY and GEMINI. Improved trajectory-measurement systems, telemetry (addition to Tel IV Central), airborne optics and airborne telemetry.

CURRENT IMPORTANT EFFORTS: Supporting all launches from this range; support to space launches from Vandenberg and Wallops Island. Reliability and care in prelaunch preparation and checkout in support of man's space flights. APOLLO requirements satisfied by acquiring three new ships, modifying two others and adding eight EC-135 aircraft. Dark-satellite tracking needs of foreign technology supported full-time.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Will continue to support present military programs. Future missile systems to be supported--advanced MINUTEMAN, Flexible Theater Missile, Improved PERSHING, POSEIDON, SUBROC and WS-120A. Space systems will include advanced maneuvering reentry system, ARSP (aerospace research support program), ASTEC (advanced solar turboelectric concept), and SLV-1B.

NAME AND LOCATION: Air Force Western Test Range (tenant)  
 Vandenberg Air Force Base, California  
 COMMAND: Air Force Systems Command (AFSC)  
 Commander: Brig. General J. S. Bleymaier

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	53.166	78.300	81.438
Total in-house RDT&E *	51.022	68.681	66.000
Annual operating cost*	-	-	-
Total RDT&E program	51.022	68.681	66.000
Total procurement program	5.970	12.420	9.263
Total O&M program	2.898	2.443	5.828
Total other programs	5.234	12.709	18.528
Total annual lab. program	65.124	96.253	99.619

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	295	0	51	178
Civilian	475	0	171	279
Total	770	0	222	457

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
39,111	19,017	192,408	/818,056/	1,029.481	37.128	96.157

MISSION: To maintain, operate, and modify (as necessary) the Western Test Range in support of DoD, NASA and other range-user programs as directed by the National Range Division and consistent with established national policies and priorities.

PAST SIGNIFICANT ACCOMPLISHMENTS: Assumption of space and ICBM range operations from Navy in February 1965. Completion of 171 launches and 12,000 support operations (command destruct checks, booster checkouts, etc.), with no destructs or launch scrubs due to range failure. Development of new, more reliable scoring system for Eniwetok.

CURRENT IMPORTANT EFFORTS: Preparation for support of TITAN III-MOL (manned orbital laboratory), including acquisition of Sudden Ranch. Creation of a reentry-scoring and trajectory-measurement station at Eniwetok.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Provide support to other agencies as a test ground for their projects. This range does not originate new military equipment, but plays a significant part in developing and proof-testing ICBM and space vehicles.

Note: This information excludes other AFSC organizations at Vandenberg, i.e., 6595th Aerospace Test Wing; Space Systems Division, etc.

NAME AND LOCATION: Aerospace Research Laboratories  
 Wright-Patterson Air Force Base, Ohio 45433  
 COMMAND: Office of Aerospace Research  
 Commander: Colonel Paul G. Atkinson, Jr.  
 Chief Scientist: Dr. Hans J. P. Von Ohain

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	6.956	7.238	7.846
Total in-house RDT&E *	6.184	6.339	6.947
Annual operating cost *	1.160	1.162	1.170
Total RDT&E program	13.871	12.332	14.057
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.772	0.899	4.039
Total annual lab. program	14.643	13.231	18.096

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	83	18	58	21
Civilian	243	55	127	127
Total	326	73	185	148

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
49.7	141,906	7,370		149.276	4.762	8.124

MISSION: Conducts and supports research in areas of the physical and mathematical sciences that offer the greatest potential for providing new knowledge essential to the continued superiority of USAF operational capability. Enhances professional development of USAF officers through student-faculty exchange programs with Air Force Institute of Technology (AFIT).

PAST SIGNIFICANT ACCOMPLISHMENTS: (1964-1966) (1) Developed particle separator in the submicron range. (2) First gas chromatographic separation of rare-earth metals. (3) Discovered chlorocarbon class of high-temperature organic compounds. (4) Characterized amorphous structure of boron filaments. (5) Obtained and analyzed satellite optical signatures.

CURRENT IMPORTANT EFFORTS: Research on supersonic compressors; on flow separation and nuclear fuel containment applicable to gas and colloidal-core reactor rocket chamber. Optimization of lifting reentry shapes and hypersonic controls. Research on types II-VI semiconducting compounds, plasma waves and striations, molecular energy-transfer processes, and optical signature techniques.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Continue research on: supersonic compressors, colloidal-core nuclear rocket engine for space flight, high-temperature materials, high-temperature gas reactions essential for propulsion technology, and behavior of bodies in hypersonic flow. Determine parameters of isocon-type LLLTV (low-light-level television) items. Study boron-additive effects on illuminants and infrared imaging techniques.

NAME AND LOCATION: Air Force Office of Scientific Research  
 Arlington, Virginia 22209  
 COMMAND: Office of Aerospace Research  
 Director: Dr. William J. Price  
 Deputy Executive Director: Colonel Ivan C. Atkinson

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	1,863	2,150	2,167
Total in-house RDT&E *	1,470	1,700	1,717
Annual operating cost*	0.500	0.500	0.500
Total RDT&E program	53,664	58,961	61,950
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.393	0.450	0.450
Total annual lab. program	54,057	59,411	62,400

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	32	3	24	8
Civilian	106	22	30	75
Total	138	25	54	83

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
NA	NA	25,593	3,961	29,554	NA	0.159

MISSION: Supports Air Force-relevant programs of extramural research in physical, engineering, environment and life sciences. In addition, administers contractual efforts for Advanced Research Projects Agency and other DoD agencies as requested.

PAST SIGNIFICANT ACCOMPLISHMENTS: Computer-designed networks. First true chemical laser. Highest continuous magnetic field, 255 kilogauss. Precipitation-hardened alloys. Cryopumping method of simulating space conditions. Found unique magnetic and electrical properties of type II superconductors. Provided interface between university community and DoD problems.

CURRENT IMPORTANT EFFORTS: Research on: Stress effects on units in isolated sites; mechanical, thermal, electronic, magnetic and superconducting properties of solids; acoustic and EM (electromagnetic) waves and coherent EM radiation. Apply abstract algebra to machine theory. Computer simulation of human mental function of pattern recognition. Better coupling of university research to DoD problems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Research on: chemical reactions to reentry, radiation effects on metals from nonmetals under extreme pressure, temperature and radiation; superconducting magnetometer as limited-war sensor; controlled nuclear fusion; optical diffraction from acoustic microwaves in solids. Studies of: tropical ecology for limited war; instabilities and onset of turbulence in plasmas. Use university talent in small study groups to solve USAF problems.

NAME AND LOCATION: Frank J. Seiler Research Laboratory  
 Academy, Colorado 80840  
 COMMAND: Office of Aerospace Research  
 Commander: Colonel Gage H. Crocker

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.461	0.607	0.597
Total in-house RDT&E *	0.232	0.354	0.344
Annual operating cost *	0.100	0.100	0.100
Total RDT&E program	0.232	0.354	0.344
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.229	0.253	0.253
Total annual lab. program	0.461	0.607	0.597

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	19	11	18	2
Civilian	18	1	5	12
Total	37	12	23	14

SPACE AND PROPERTY

Space (square feet)				Cost (in \$ millions)		
Acres	Laboratory	Administrative	Other	Total building	Real property	Equipment
NA	7,855	1,335		9,190	NA	0.989

MISSION: Conducts basic research in chemistry, aerospace mechanics and applied mathematics. Supports selected faculty and cadet research whose product is within the scope of its mission. Operates a general-purpose scientific digital computer in support of its mission and that of the USAF Academy.

PAST SIGNIFICANT ACCOMPLISHMENTS: Low-cost technique for x-ray diffraction photography at high temperatures. Spectrophotometric determination of kinetics of reaction of glucose-oxidase with glucose. Installation and checkout of low-density shock tube. Improved mathematical techniques for trajectory optimization. Mathematical analysis of control of unstable mechanical systems, i.e., certain types of missiles.

CURRENT IMPORTANT EFFORTS: Kinetics of reactions of various hindered phenols with phosphorus chlorides. Investigate shock-wave structure and fast heat-transfer problems. Optimal attitude and velocity control of a spinning vehicle. Sensitivity analysis of multivariable systems.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Research in electrolysis related to high-temperature fuel cells. Research related to reentry gas dynamics and high-speed, high-altitude flight. Improve computer capability, including the possible addition of remote consoles. Continue to develop mathematics of optimal control for aerospace vehicles. Continue development of special programming languages.

NAME AND LOCATION: Air Force Cambridge Research Laboratories  
L. G. Hanscom Field, Massachusetts 01730

COMMAND: Office of Aerospace Research

Commander: Colonel Robert F. Long

Chief Scientist: Dr. John N. Howard

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	23,013	23,331	24,350
Total in-house RDT&E*	21,397	21,632	22,551
Annual operating cost*	5,661	5,661	5,661
Total RDT&E program	62,250	60,278	67,396
Total procurement program	0	0	0
Total O&M program	0.001	0.001	0.001
Total other programs	4,941	1,699	2,697
Total annual lab. program	67,192	61,978	70,094

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	196	7	79	117
Civilian	904	133	521	383
Total	1,100	140	600	500

SPACE AND PROPERTY

Acres	Space (square feet)			Cost (in \$ millions)		
	Laboratory	Administrative	Other	Total building	Real property	Equipment
873.89	536,528	23,903	/92,808/	653,239	16.575	26.903

MISSION: Conducts and supports Air Force-relevant research in environmental and physical sciences. Conducts and supports assigned exploratory-development efforts.

PAST SIGNIFICANT ACCOMPLISHMENTS: (1963-1966) Demonstrated feasibility of an over-the-horizon detection system. Developed techniques and equipment for contrail suppression. Understanding the diffusion of pollutants in the atmosphere. Published *Handbook of Geophysics and Space Environment*. Helicopter ground-fire-detection system.

CURRENT IMPORTANT EFFORTS: Techniques for space-environment forecasting. Techniques for high-power radar measurement of clear-air turbulence. R&D on bandwidth compression of video and audio signals. R&D for reduction of radar-target effective cross section. Determine optical signatures of booster and reentry vehicles.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Planned center for USAF R&D in geophysics, covering meteorology, geology, geodesy, gravity, the dynamics of the upper atmosphere, astronomy and astrophysics. To integrate this effort with other laboratory efforts in electronics and electro-optics. To provide consultant services to other laboratories and development divisions on problems involving interaction between systems and the environment.

NAME AND LOCATION: Office of Research Analyses  
Holloman Air Force Base, New Mexico 88330  
COMMAND: Office of Aerospace Research (OAR)  
Commander: Lt. Colonel Roderick W. Clarke  
Technical Director: Dr. Gerhard R. Eber

PROGRAM DATA BY FISCAL YEAR (in \$ millions)

Program	Prior year (actual)	Current year (actual & est.)	Budget year (estimate)
Total in-house program*	0.677	0.760	0.810
Total in-house RDT&E *	0.511	0.566	0.605
Annual operating cost*	0.176	0.181	0.189
Total RDT&E program	0.701	0.766	0.805
Total procurement program	0	0	0
Total O&M program	0	0	0
Total other programs	0.342	0.374	0.394
Total annual lab. program	1.043	1.140	1.199

Note: \*Included in the totals.

PERSONNEL DATA--END OF PRIOR FISCAL YEAR

Personnel	Authorized strength	Total Ph.D.'s	Total professionals	Total nonprofessionals
Military	13	0	11	2
Civilian	29	8	17	12
Total	42	8	28	14

## SPACE AND PROPERTY

Acres	Space (square feet)			Total building	Cost (in \$ millions)	
	Laboratory	Administrative	Other		Real property	Equipment
NA	4,548	1,559	4,687	10,794	0.193	0.082

**MISSION:** Develops decision information through the conduct of systems research and mission analyses to assist responsible agencies, ensure that USAF basic research programs are relevant to future military aerospace missions, and to inform weapon-system-planning activities of the operational implications of new research findings.

PAST SIGNIFICANT ACCOMPLISHMENTS: Studied defense in depth against ballistic-missile attack (NIKE-X low-altitude defense system) airborne BPI (ballistic point of impact). and satellite BPI area intercept. Identified technical barriers and research opportunities for cost-effective BPI. Compiled handbook on small probe vehicles. Studied defense of hard-based missile sites. Studied application of OAR research results for space propulsion.

CURRENT IMPORTANT EFFORTS: Study area defense against ballistic-missile attack--midcourse intercept. Identify technical barriers and research opportunities for limited-war missions. Identify applications of plasma-thruster research for satellite ACS (airborne control system). Develop methods of long-range forecasting. Identify future aerospace-system concepts.

PLANNED RESPONSIBILITIES OF LABORATORY ON FUTURE MILITARY PROBLEMS: Study strategic offense forces in ballistic-missile defense environment. Continue to: Identify research applications, technical barriers and research opportunities for limited-war missions; develop long-range forecasting methods; and identify future aerospace-system concepts.

## ABBREVIATIONS

AACS----airborne astrographic camera system	ATDS----airborne tactical data system
AACS----Army area communications system	AUTEC---Atlantic Undersea Test Evaluation Center
AAFSS---advanced aerial fire-support system	BIS-----Board of Inspection and Survey
ABRES---advanced ballistic reentry system	BMEWS---ballistic-missile early warning system
ACS-----attitude-control system	BPI-----boost-phase intercept
ADSAF---automatic data systems for the Army in the field	BuWeps--Bureau of Naval Weapons
ADWAR---advanced directional warhead	BW-----biological warfare
AFAADS--advanced field Army air defense system	BWS-----burn-wound sepsis
AFIT----Air Force Institute of Technology	CBR-----chemical, biological, radiological
AFROTC--Air Force Reserve Officers Training Corps	CD-----component development
AMC----Army Materiel Command	CEP-----circular probable error
AMS----Army Map Service	CM-----countermeasures
AMSA---advanced manned strategic aircraft	CNS-----central nervous system
APRL----Army Prosthetics Research Laboratory	COOC----combat operations center
APTI----automatic point transfer instrument	COMCM---communications countermeasures
AR-----Army regulation	CONUS---continental United States
AR/AAV--armored reconnaissance/airborne assault vehicle	CW-----continuous-wave
ARD-----acute respiratory disease	DCS-----Defense communications system
ARM-----antiradiation missile	DMS-----direct-molded sole
ARO-----Army Research Office	DoD-----Department of Defense
ARSP----aerospace research support program	DSSP---deep-sea submergence program
A&S-----aerodynamics and structures	ECCM----electronic counter-countermeasures
ASA-----Army Security Agency	ECM-----electronic countermeasures
ASFIR---active swept-frequency interferometer radar	ECOM---Army Electronics Command
ASTEC---advanced solar turbo-electric concept	ELINT---electronic intelligence
ASTIS---advanced satellite-tracking system	ELSEC---electronic security
ASW-----antisubmarine warfare	EM-----electromagnetic
ASWS---Antisubmarine Warfare Service	EMP-----electromagnetic pulse
ATAC---Army Tank-Automotive Command	EOD-----explosive ordnance disposal
	ERDA---Army Electronics Research and Development Activity
	ET-----electronics technician
	FAX-----fuel-air explosives
	FBM----Fleet ballistic missile

## ABBREVIATIONS (continued)

FD-----frequency-diversity	MTDS---Marine tactical data system
FRG----Federal Republic of Germany	MUSAT---multiple-station analytical triangulation
FR/IED--fundamental research/independent exploratory development	
G&A----general and administrative	NA-----not applicable
Gc-----gigacycles per second	NARDIS--Navy research and development information system
GM-----guided missile	NASA----National Aeronautics and Space Administration
GPES----general-purpose personnel-extraction system	NBL----Naval Biological Laboratory
gpm----gallons per minute	NEWS---Navy electronic-warfare simulator
HEST----high-explosive simulation tests	NF-----nitrogen fluoride
HLH----heavy-lift helicopter	NL-----Navy-lightered
HPI----high-powered illuminator	NOA----new obligational authority
IC-----interior communications (ship)	NORAD---North American Air Defense Command
ICBM---intercontinental ballistic missile	NTDS---Naval tactical data system
IAFWG---Interim Forward-Area Weapons Group	OAO----orbiting astronomical observatory
IFF----identification of friend or foe	OAR----Office of Aerospace Research
ILAAS---integrated light attack avionics system	O&M----operations and maintenance
IR-----infrared	OPTEVFOR--Operational Test and Evaluation Force (Navy)
I <sub>sp</sub> ----specific impulse	PAD----propellant-activated device
JEEP----joint environmental effects program	pibal---pilot balloon
JMEM---Joint Munitions Effectiveness Manual	POL----petroleum, oil, lubricants
kwe----kilowatts (electrical)	RALS---runway-arresting landing site
LADS----light attack defense system	RDT&E---research, development, test and evaluation
LAPES---low-altitude personnel-extraction system	R&D----research and development
LLLTV---low-light-level television	SAC----Strategic Air Command
LOPAIR---long-path infrared	SATS---short airfield tactical support
LOTS----logistical over-the-shore	SAWC---special air warfare center
MCA----military construction, Army	SCRAMJET--supersonic combustion ramjet
MCM----mine countermeasures	SEAL---sea-air-land
Mev----million electron volts	SECT----secure emergency communications transmitter
MOL----manned orbital laboratory	SIOP----single integrated operations plan
MRRS---multiple-rail rocket system	SISS---submarine integrated sonar system
MSTS---Military Sea Transportation Service	SLAST---anti-surface-ship torpedo
	SMS----surface missile system

#### ABBREVIATIONS (continued)

SPE-----systems performance effectiveness	UDT-----underwater demolition team
SRAM----short-range attack missile	UET-----universal engineer tractor
SST-----supersonic transport	UHF-----ultra-high-frequency
STAAS---surveillance and target-acquisition aircraft system	USAREUR--U.S. Army, Europe
	UTTAS---utility tactical transport aircraft system
TAC-----Tactical Air Command	VADS----vehicle air defense system
TACS----tactical air control system	VAL-----visual landing aids
TAWC----tactical air warfare center	VCR-----variable compression ratio
TAWS/PEP--tactical air weapon system performance-evaluation program	VHF-----very-high-frequency
TIIF----tactical image-interpretation facility	VHO-----very-high-output
TREES---transient radiation effects on electronic systems	VLF-----very-low-frequency
TURPS---terrestrial unattended reactor power system	VRFWS---vehicle rapid-fire weapon system
	V/STOL--vertical/short takeoff and landing
	WISE----weapons installation system evaluation
	WSAT----weapons system accuracy trials

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